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OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

The information contained in this document is believed to be correct, but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

WARNING: These products are not designed for use in, and should not be used for, patient-connected applications.

This device is marked with the international caution symbol. It is important to read the Setup Guide before installing or commissioning this device as the guide contains important information relating to safety and EMC.

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NOTES, WARNINGS and CAUTIONS

Information that is especially important to note is identified by following labels:

- **NOTE**
- **WARNING or CAUTION**
- **IMPORTANT**
- **TIP**

NOTE: Provides you with information that is important to successfully setup and use the iServer.

CAUTION or WARNING: Tells you about the risk of electrical shock.

CAUTION, WARNING or IMPORTANT: Tells you of circumstances or practices that can effect the instrument's functionality and must refer to accompanying documents.

TIP: Provides you helpful hints.

PART 1
INTRODUCTION

1.1 Safety and EMC Considerations

Refer to the CE Approval Section

EMC Considerations

- Whenever EMC is an issue, always use shielded cables.
- Never run signal and power wires in the same conduit.
- Use twisted-pair wires for signal connections.
- Install Ferrite Bead(s) on signal wires close to the instrument if EMC problems persist.

Failure to follow all instructions and warnings may result in injury!

1.2 Before You Begin

Inspecting Your Shipment: Remove the packing slip and verify that you have received everything listed. Inspect the container and equipment for signs of damage as soon as you receive the shipment. Note any evidence of rough handling in transit. Immediately report any damage to the shipping agent. The carrier will not honor damage claims unless all shipping material is saved for inspection. After examining and removing the contents, save the packing material and carton in the event reshipment is necessary.

Customer Service: If you need assistance, please contact the Customer Service Department nearest you.

Manuals, Software: The latest Operation Manual as well as free configuration software (**iConnect**), datalogging software (**iLog**), and **Mail Notifier** are available at **the website listed on the cover page of this manual or on the CD-ROM enclosed with your shipment**.

1.3 Description

Note **This device can be purchased as a stand alone DIN Rail mounted unit, or as a bench/wall mount unit.**

The iServer is a stand alone Ethernet Server designed to connect devices with serial interfaces to the Ethernet network using the TCP/IP protocol. It contains Ethernet and RS232/RS485 interfaces.

The standard features include:
- Use standard Web Browser, TCP connection, HTTPget DOS program or Telnet Simulation, for network connectivity.
- Install via RS232/RS485 serial port connection.
- Transfer data from RS232/RS485 serial interface to TCP/IP using built-in socket server.
- Use a standard home page or customize Web page for OEM applications.

The following example illustrates how you can hookup the devices with serial interface on the network using the iServer:

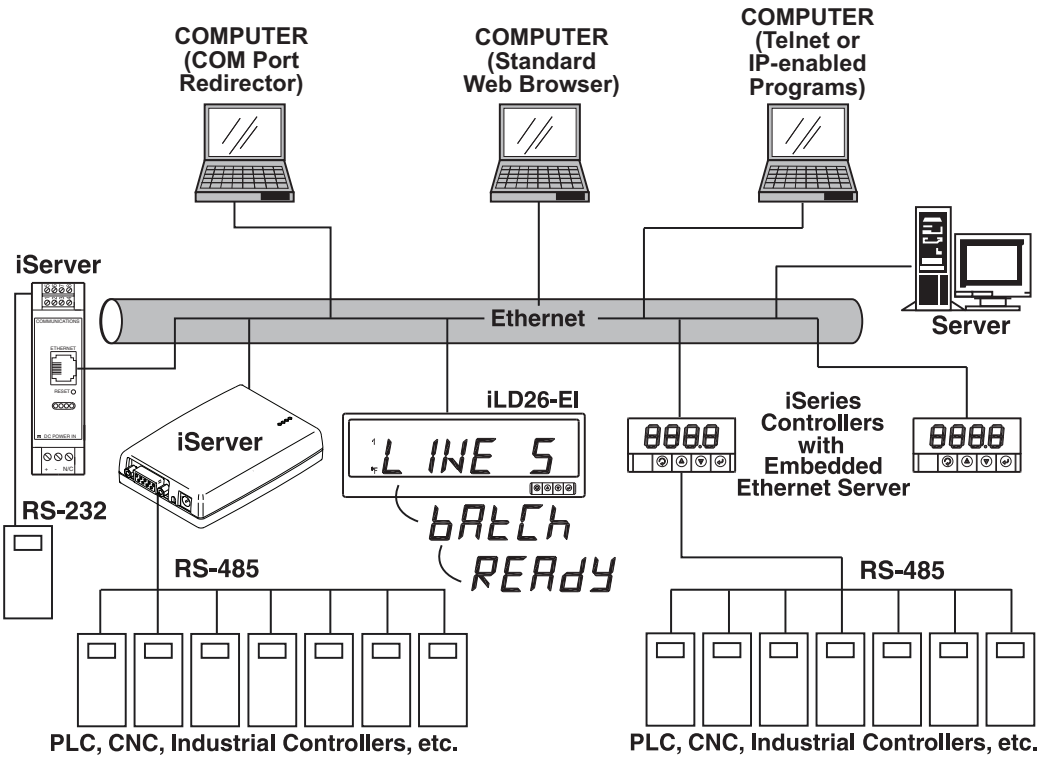


Figure 1.1 Accessing Devices Over the Ethernet

PART 2
HARDWARE

2.1 Mounting

2.1.1 Mounting the Wall Mount iServer

Position unit where required. Mark and drill the two #6 screw holes.

After bracket is mounted on the wall, align back of unit over the three bracket clips, once engaged, slide downward, the unit will snap in place.

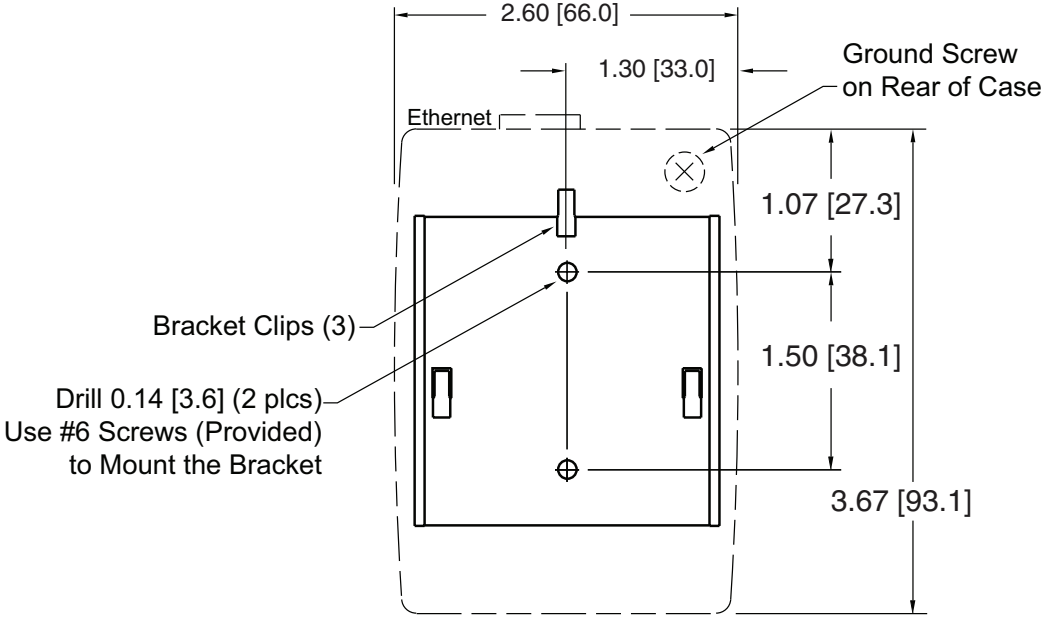


Figure 2.1 Mounting - Wall Mount iServer

Note It is recommended that you ground your unit. With one end of a wire connected to earth ground, the other side can be wraped around the ground screw, located on the bottom of the case.

Note If unit is to be mounted on a flat surface, you may take the bottom rubber feet off the unit.

For overall dimensions of unit, refer to **Figure 5.1** in Specifications Section.

2.1.2 Mounting the DIN Rail iServer

To install unit onto DIN Rail:

a) Tilt unit, position mounting slot onto DIN Rail, as shown.
b) Push unit towards DIN Rail and it will snap into place.

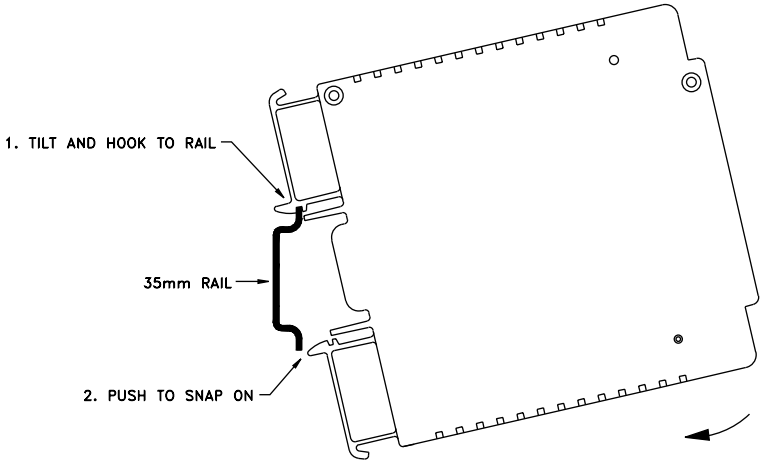


Figure 2.2 Mounting - DIN Rail iServer

2.1.2.1 Removal from a DIN Rail

a) Insert flat screw-driver into tab and push downwards.
b) Unit will detach from DIN Rail.

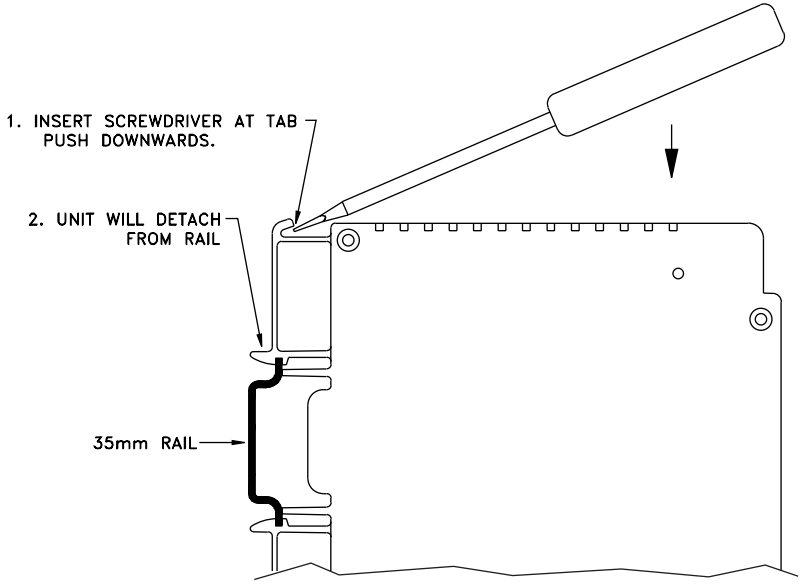


Figure 2.3 Removal - DIN Rail iServer

For overall dimensions of unit, refer to **Figure 5.2** in Specifications Section.

2.2 DIP Switches

2.2.1 DIP Switch Usage

The iServer is shipped with all DIP switches in **"OFF"** position.

1 To change the IP address, gateway address, and subnet mask from the serial port
2 To change to default factory settings
3 To enable/disable DHCP
4 To enable/disable Terminal Server function

Note ☞ To set the iServer to factory default settings, slide DIP switch **#2** to **ON** position. Power the iServer on and wait about 10 seconds until the iServer fully boots up. Set the DIP switch **#2** back to **OFF** position (it does not matter if the iServer is powered ON or OFF, just make sure that the DIP switch is set to OFF, otherwise, every time the unit is power-cycled the factory settings will take over.

Note ☞ To enable the DHCP, besides using DIP switch **#3**, set the iServer's IP address to **0.0.0.0**. An iServer with IP address of **0.0.0.0** will request an IP address, gateway address, and subnet mask from the DHCP server over the Ethernet.

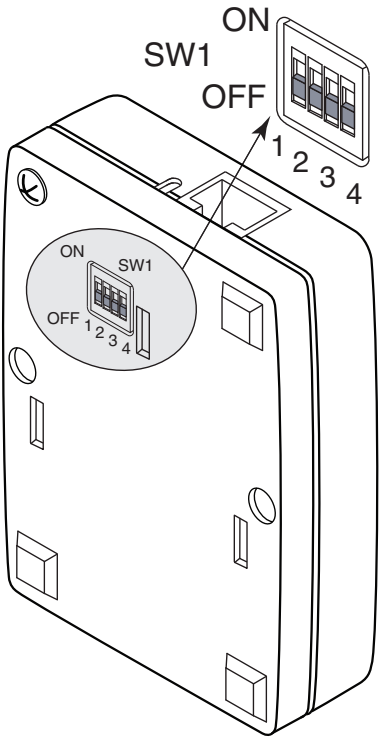


Figure 2.4a DIP Switch Wall Mount iServer

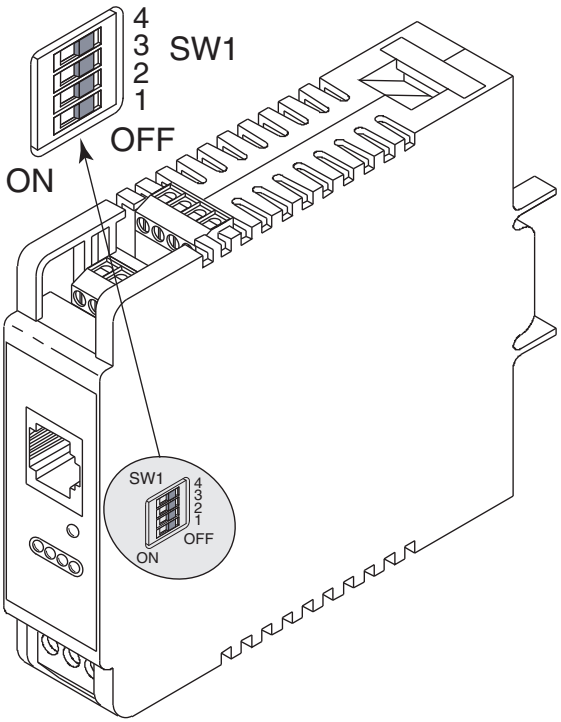


Figure 2.4b DIP Switch DIN Rail iServer

2.3 Parts of the iServer Unit

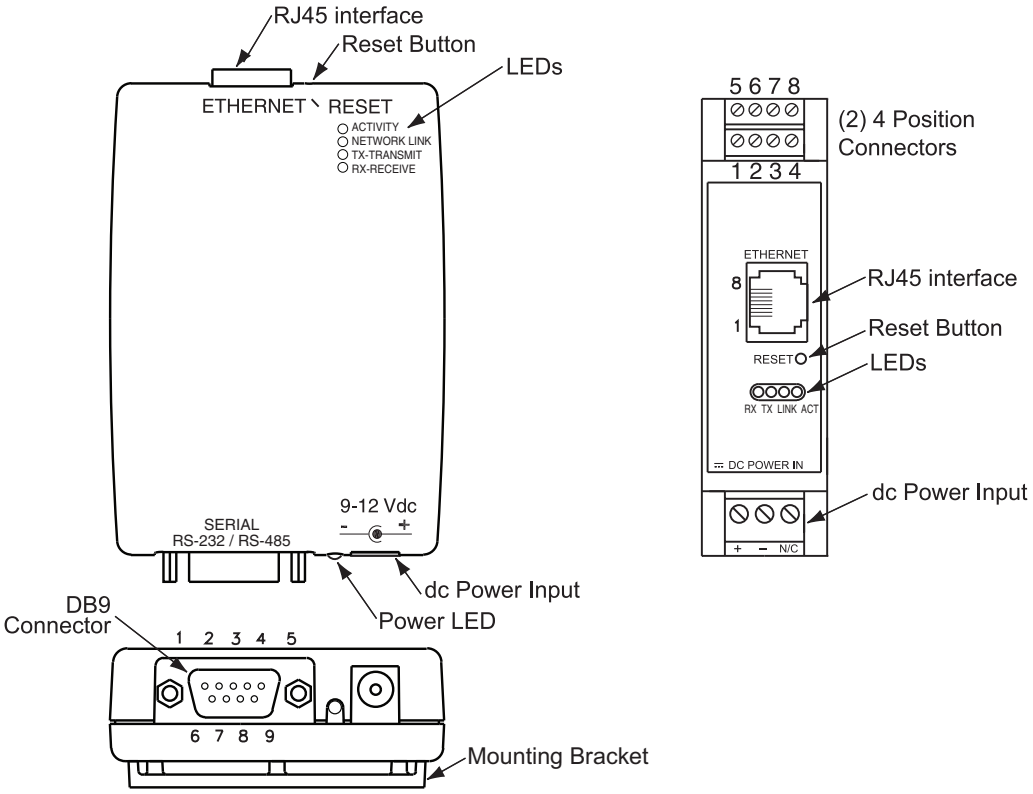


Figure 2.5 Parts of the iServer Unit

Table 2.1 Parts of iServer Unit

SERIAL	DB9 male (DTE Configuration) or 2, four position connectors for RS232 / RS485 connections
ETHERNET	RJ45 interface for 10BASE-T connection.
RESET	Button: Used for power reseting the iServer.
ACTIVITY	LED (Red) Blinking: Indicates network activities (receiving or sending packets).
NET LINK	LED (Green) Solid: Indicates good network link.
TX	LED (Yellow) Blinking: Indicates transmitting data to the serial port.
RX	LED (Green) Blinking: Indicates receiving data on the serial port.
POWER	LED (Green) Solid: Indicates Power-ON.
DC Power Supply Section:	
+	Plus power supply wire connection (inside the plug for -W).
-	Minus power supply wire connection (outside the plug for -W).

2.4 Serial Communication Interfaces

Two communication interfaces are supported in the iServer: RS232 and RS485. These standards define the electrical characteristics of a communication network. The RS485 port of the iServer is fully compatible to use with RS485 instruments. The RS485 is an extended version of the RS422 communication standard which increases the allowable number of devices from 10 to 32 by improving the electrical characteristics.

- The **RS232** standard (point-to-point) allows a single device to be connected to an iServer. The iServer operates with full-duplex RS232 using eight wires: Rx-receive, Tx-transmit, DTR, DSR, DCD, CTS, RTS and common ground wires. RS232 cable length is limited to 50 feet.
- The **RS485** standard (multi-point) allows one or more devices (multi-dropped) to be connected to the iServer using a two-wire connection (half-duplex) +Rx/+Tx and –Rx/-Tx. Use of RS485 communications allows up to 31 devices to connect to the iServer with cable length up to 4000 feet long.

Although the RS485 is commonly referred to as a "two wire" connection, the iServer also provides a ground/return shield connection to use as a common connection for EMI noise protection.

Table 2.2 shows the differences between RS232 and RS485 communication interfaces.

Table 2.2

Data Transmission Characteristics	RS232	RS485
Transmission Mode	Single ended	Differential
Electrical connections	8 wire (-W); 7 wire (DIN Rail)	2 wire
Drivers per line	1 driver	32 drivers
Receivers per line	1 receiver	32 receiver
Maximum cable length	50 ft (15 meters)	4000 ft (1200 meters)

Changing between RS232 and RS485 interfaces, as well as modifying the other parameters is possible through the iServer firmware using its home Web page or Telnet connection (see **Part 4** for details).

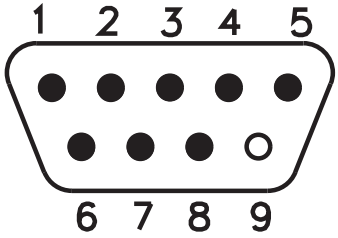
2.4.1 Wiring RS232 Interface -- Wall Mount iServer

Table 2.3 shows the signals and the direction of signals on the DB9 (DTE configuration) RS232 Serial Port.

Table 2.3

Wall Mount iServer		
DB9 Pin#	**Signal**	**Direction**
1	DCD	IN
2	Rx	IN
3	Tx	OUT
*4	DTR	OUT
5	GND	--
*6	DSR	IN
*7	RTS	OUT
*8	CTS	IN
9	N/C	N/C

* These 4 pins can also be used as digital input/output signals (firmware selection).



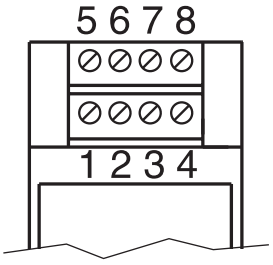
2.4.2 Wiring RS232 Interface -- DIN Rail iServer

Table 2.4 shows the signals and the direction of signals on the Screw Terminal Block connector.

Table 2.4

DIN Rail iServer		
Pin #	**Signal**	**Direction**
1	N/C	--
2	GND	--
3	Rx	IN
4	Tx	OUT
*5	DCD	IN
*6	RTS	OUT
*7	DTR	OUT
*8	CTS	IN

* These 4 pins can also be used as digital input/output signals (firmware selection).



2.4.3 Wiring RS485 Interface -- Wall Mount iServer

RS485 interface uses a two-wire communication system (one for transmitting and one for receiving) plus a common wire to connect to the shield of the cable. It is recommended to use a shielded cable with one twisted pair.

Note Use of twisted pair and shield will significantly improve noise immunity.

Figure 2.6 shows multi-point, half-duplex RS485 interface connections for the iServer.

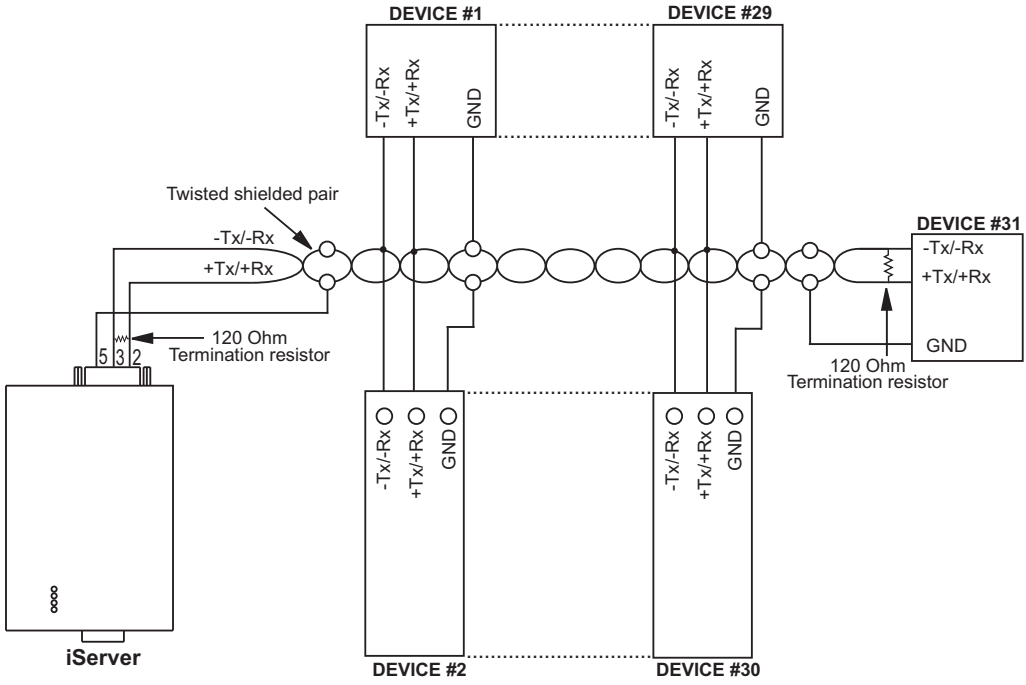


Figure 2.6 Multi-point, Half-Duplex RS485 Wiring - Wall Mount iServer

Note Value of the termination resistor is not critical and depends on the cable impedance.

Table 2.5 shows RS485 half-duplex hookup between the iServer serial port and device with RS485 communication interface.

Table 2.5

Pin#	iServer	DEVICE WITH RS485
2	+Tx/+Rx (+Transmit/+Receive)	+Tx/+Rx (+Transmit/+Receive)
3	-Tx/-Rx (-Transmit/-Receive)	-Tx/-Rx (-Transmit/-Receive)
5	RTN (Common GND)	GND (Common GND)

2.4.4 Wiring RS485 Interface -- DIN Rail iServer

RS485 interface uses a two-wire communication system (one for transmitting and one for receiving) plus a common wire to connect to the shield of the cable. It is recommended to use a shielded cable with one twisted pair.

Note Use of twisted pair and shield will significantly improve noise immunity.

Figure 2.7 shows multi-point, half-duplex RS485 interface connections for the iServer.

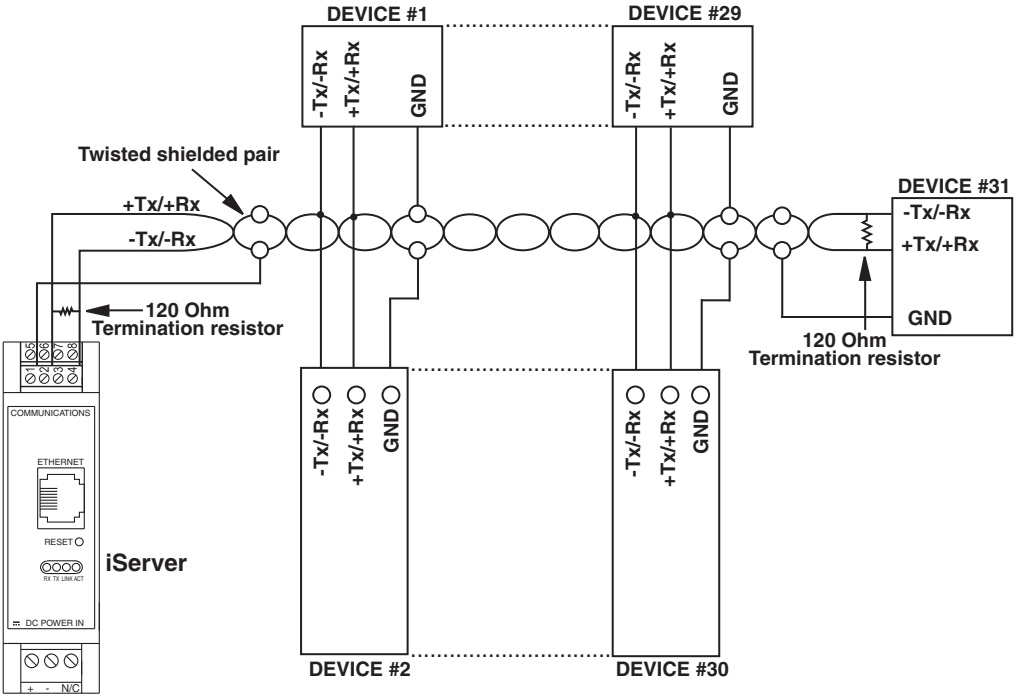


Figure 2.7 Multi-point, Half-Duplex RS485 Wiring - DIN Rail iServer

Note Value of the termination resistor is not critical and depends on the cable impedance.

Table 2.6 shows RS485 half-duplex hookup between the iServer serial port and device with RS485 communication interface.

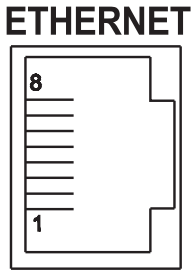
Table 2.6

Pin#	iServer	DEVICE WITH RS485
3	+Tx/+Rx (+Transmit/+Receive)	+Tx/+Rx (+Transmit/+Receive)
4	-Tx/-Rx (-Transmit/-Receive)	-Tx/-Rx (-Transmit/-Receive)
2	RTN (Common GND)	GND (Common GND)

2.5 Network Communication Interfaces

2.5.1 10Base-T RJ-45 Pinout

The 10BASE-T Ethernet network (RJ-45) system is used in the iServer for network connectivity. The 10 Mbps twisted-pair Ethernet system operates over two pairs of wires. One pair is used for receiving data signals and the other pair is used for transmitting data signals. This means that four pins of the eight-pin connector are used.



Pin	Name	Description
1	+Tx	+ Transmit Data
2	-Tx	- Transmit Data
3	+RX	+ Receive Data
4	N/C	Not Connected
5	N/C	Not Connected
6	-Rx	- Receive Data
7	N/C	Not Connected
8	N/C	Not Connected

Figure 2.8 RJ45 Pinout

2.5.2 10Base-T Crossover Wiring

When connecting the iServer directly to the computer, the transmit data pins of the computer should be wired to the receive data pins of the iServer, and vice versa. The 10Base-T crossover cable with pin connection assignments are shown on **Figure 2.9**.

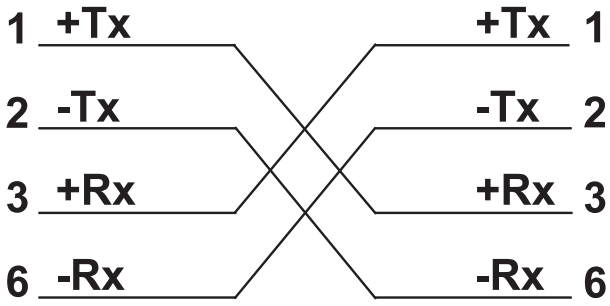


Figure 2.9 10Base-T Crossover Cable Wiring

Use straight through cable for connecting the iServer to an Ethernet hub. The ports on the hub are already crossed.

PART 3
NETWORK CONFIGURATION

3.1 Network Protocols

The iServer can be connected to the network using standard TCP/IP protocols. It also supports ARP, HTTP (WEB server), DHCP, DNS and Telnet protocols.

3.2 Ethernet (MAC) Address

MAC (Media Access Control) address is your computer's unique hardware number. When you're connected to the LAN from your computer, a correspondence table relates your IP address to your computer's physical (MAC) address. The MAC address can be found on the label of your device and contains 6 bytes (12 characters) of hexadecimal numbers **XX:XX:XX:XX:XX:XX** hex

For example: 0A:0C:3D:0B:0A:0B

Note Remove the small label with the default IP address and there will be room to put your IP address. See **Figure 3.1**

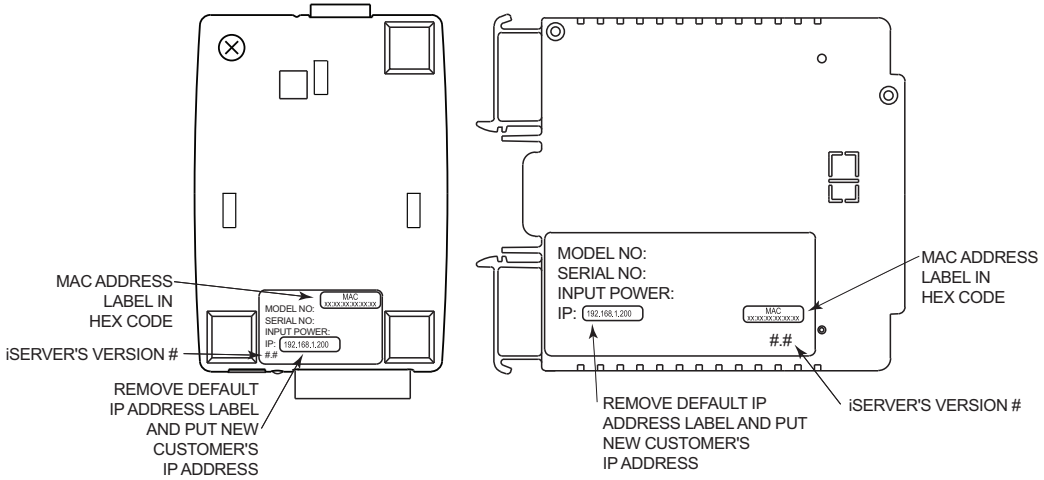


Figure 3.1 Labeling

3.3 DHCP

DHCP, Dynamic Host Configuration Protocol enables individual computers or devices to extract their IP configurations from a server (DHCP server). If the DHCP is enabled on your iServer, as soon as the iServer is connected to the network, there is an exchange of information between DHCP server and the iServer. During this process the IP address, the Gateway address, and the Subnet Mask will be assigned to the iServer by the DHCP server. Note that the DHCP server must be correctly configured to make such assignment.

If fixed or static IP address is desired, the DHCP must be disabled. The iServer is shipped with DHCP disabled (factory default). The DHCP can be enabled by setting the DIP switch **# 3** to the **"ON"** position (refer to **Figure 3.2**).

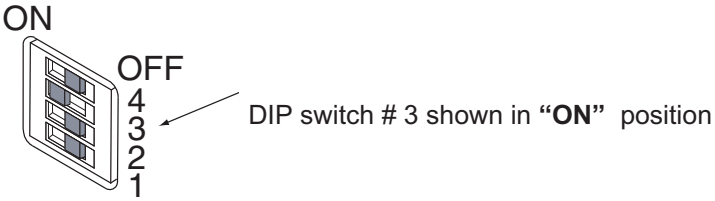


Figure 3.2 DIP Switch on the Bottom Side of iServer

Note Setting the iServer's IP address to **0.0.0.0** will also enable DHCP.

3.4 DNS

DNS, Domain Name System enables individual computers and devices to be recognized over a network based on a specific name instead of an IP address. For example, instead of having to use ***http://192.168.1.200*** (IP address), you would use only ***http://eis03ec*** or any eight character name stored as Host Name under Access Control page in the iServer Home Page. The default DNS name for an iServer is **"eis"** followed by the last four digits of the MAC address of that particular iServer.

Note

1. It is very important to communicate with the network administrator in order to understand the DHCP and its existing configurations on the host server, before enabling the DHCP on the iServer.
2. The iServers are shipped with a default static IP address of **192.168.1.200** and Subnet Mask of **255.255.255.0**.
3. On Novell networks or Windows 2000 where the DCHP is an updated function of DNS this feature may be beneficial since a particular name can be assigned eliminating the need for the IP address, as described in **Section 3.4.**

3.5 IP Address

Every active device connected to the TCP/IP network must have a unique IP address. This IP address is used to build a connection to the iServer's serial port. Every computer using TCP/IP should have a unique 32-bit address. It is divided into two portions, the network ID and the host ID. For instance, every computer on the same network uses the same network ID. At the same time, all of them have a different host ID. For more details about the IP address see **Appendix B**.

3.5.1 Default IP Address

The iServer is shipped with a default IP address set to **192.168.1.200** and Subnet Mask of **255.255.255.0**. If you are going to use a Web browser or Telnet program to access the iServer using its default IP address, make sure that the PC from which you're establishing the connection has an IP address that is in the same range as the iServer's IP address (**192.168.1.x**, where **x** can be any number from 1 to 254).

Note Your PC's IP address cannot be the same as the iServer's IP address).

You also need to make sure that your PC's Subnet Mask is **255.255.255.0**. This is a good way to access the iServer over the network and make any configuration changes needed. If **192.168.1.200** address is already in use on your network, use an Ethernet crossover cable between your computer and the iServer to change the IP address or any other settings within the iServer.

3.6 Port Number

All TCP connections are defined by the IP address and a port number. A port number is an internal address that provides an interface between an application running on your computer and the network through the TCP/IP protocol.

There are three default TCP port (socket) numbers assigned to the iServer:

1. Port (socket) number 1000 when using HTTPget program (see **Section 4.8**).
2. Port (socket) number 2000 when trying to access your serial device connected to the serial port of the iServer.
3. Port (socket) number 2002 when trying to access the iServer itself for reading or changing the settings. This can be done using Windows standard Telnet application.

Power recycling the iServer can also be done through the iServer's Web Server (see **Section 4.2**).

Telnet stands for Telecommunications Network, it is a protocol that provides a way for users (or clients) to connect to computers (or servers) on a network, whether in the next building or across the world.

Example: C:\>Telnet 192.168.1.200 2002

You will then get the following screen.

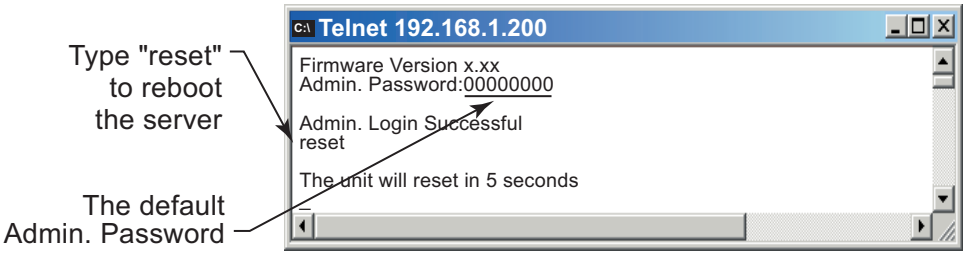


Figure 3.3 Telnet Login into the iServer

You can open a Telnet session using other terminal emulation programs like Tera Term Pro (downloadable from the internet), which is a free software for MS-Windows. It supports VT100 emulation, Telnet connection and serial com port connections.

PART 4
OPERATIONS

This iServer can be used and configured in several ways, depending on user's preference and network setup. It can be used in Telnet simulation mode where it emmulates serial communication operation over a network cable or directly from a Web browser, like Netscape or Internet Explorer. It can also be configured using the iConnect Configuration Software.

If DHCP and DNS servers are used, the connection is very simple, you do not need to worry about IP address, MAC address, or network conflicts, all of these issues are solved for you by your network DHCP and DNS server. All that is left for you to do, is to enable DHCP on the iServer (see **Section 2.2**) and use a straight network cable to connect the iServer to a hub and power it up.

If DHCP is not the preferred method, you can configure your PC's network connection with an IP address of **192.168.1.x** that is in the same range as the iServer's default IP address (**192.168.1.200**) and connect to the iServer using a cross-over network cable between your PC's network port and the iServer. After you're done with configuring the iServer, you can always set your PC back to its original settings.

On your computer, from the MS-DOS Prompt window type "**ping 192.168.1.200"** and press Enter. If DHCP and DNS servers are used type **"ping eisxxxx"**, where xxxx are the last four digits of the iServer's MAC address, located on the back of the device. You should get a reply as shown in **Figure 4.1**.

Note

You can use the host name (**eisxxxx**) instead of its IP address only if your DHCP server is configured to communicate with your DNS. Please consult with your IT department for details.

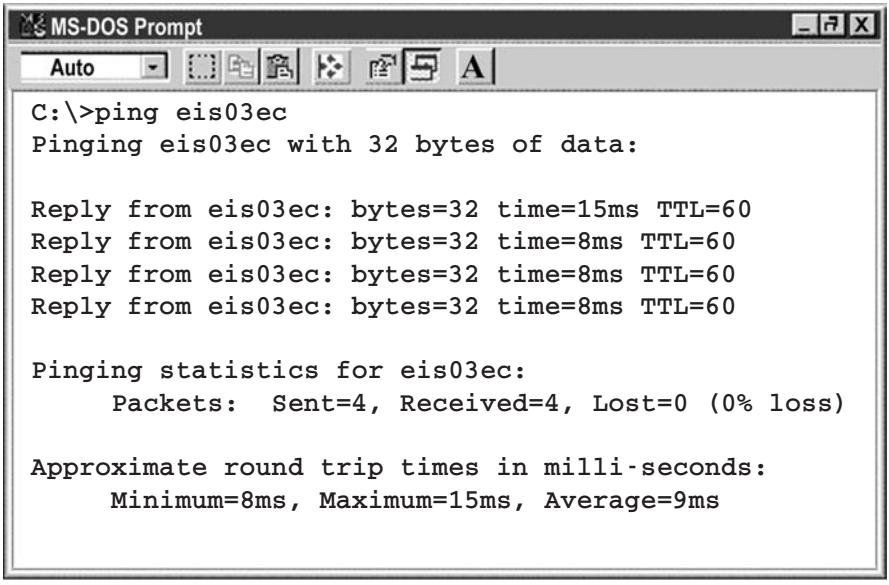

MS-DOS Prompt
Auto
C:\>ping eis03ec
Pinging eis03ec with 32 bytes of data:
Reply from eis03ec: bytes=32 time=15ms TTL=60
Reply from eis03ec: bytes=32 time=8ms TTL=60
Reply from eis03ec: bytes=32 time=8ms TTL=60
Reply from eis03ec: bytes=32 time=8ms TTL=60
Pinging statistics for eis03ec:
Packets: Sent=4, Received=4, Lost=0 (0% loss)
Approximate round trip times in milli-seconds:
Minimum=8ms, Maximum=15ms, Average=9ms

Figure 4.1 Pinging the iServer from MS-DOS Prompt

This proves that the connection is proper and you can get into configuration or run mode using the Telnet or Web browser.

4.1 iConnect Software

The iServer may also be assigned an IP Address by using the iConnect software.

a) Download the iConnect software from the website listed in this manual.

b) Install iConnect software on a networked PC. This software is compatible with Windows 95, 98, NT, 2000, and XP.

c) Use iConnect to assign an IP address to the iServer and access its web pages for configuration. You can also use any standard web browser to access the iServer's web pages. Consult with your IT department for obtaining an IP address.

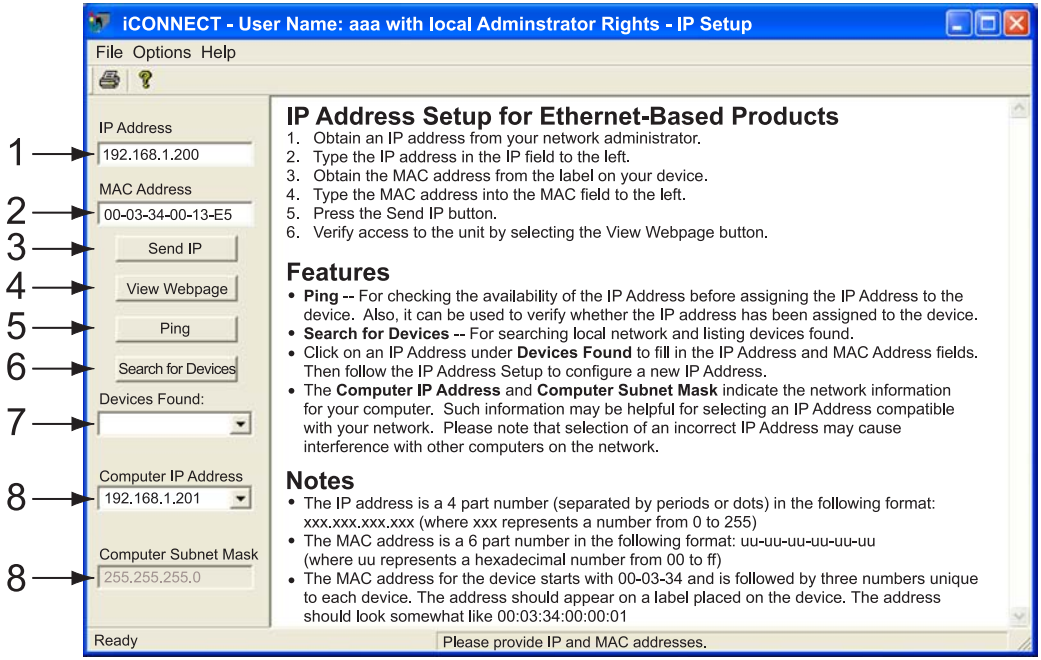

iCONNECT - User Name: aaa with local Adminstrator Rights - IP Setup
File Options Help
IP Address
192.168.1.200
MAC Address
00-03-34-00-13-E5
Send IP
View Webpage
Ping
Search for Devices
Devices Found:
Computer IP Address
192.168.1.201
Computer Subnet Mask
255.255.255.0
1
2
3
4
5
6
7
8
8
IP Address Setup for Ethernet-Based Products
1. Obtain an IP address from your network administrator.
2. Type the IP address in the IP field to the left.
3. Obtain the MAC address from the label on your device.
4. Type the MAC address into the MAC field to the left.
5. Press the Send IP button.
6. Verify access to the unit by selecting the View Webpage button.
Features
• Ping -- For checking the availability of the IP Address before assigning the IP Address to the device. Also, it can be used to verify whether the IP address has been assigned to the device.
• Search for Devices -- For searching local network and listing devices found.
• Click on an IP Address under Devices Found to fill in the IP Address and MAC Address fields. Then follow the IP Address Setup to configure a new IP Address.
• The Computer IP Address and Computer Subnet Mask indicate the network information for your computer. Such information may be helpful for selecting an IP Address compatible with your network. Please note that selection of an incorrect IP Address may cause interference with other computers on the network.
Notes
• The IP address is a 4 part number (separated by periods or dots) in the following format: xxx.xxx.xxx.xxx (where xxx represents a number from 0 to 255)
• The MAC address is a 6 part number in the following format: uu-uu-uu-uu-uu-uu (where uu represents a hexadecimal number from 00 to ff)
• The MAC address for the device starts with 00-03-34 and is followed by three numbers unique to each device. The address should appear on a label placed on the device. The address should look somewhat like 00:03:34:00:00:01
Ready
Please provide IP and MAC addresses.

Figure 4.2 Assigning an IP Address using iConnect

1) Place the IP address in this box.
2) Take the MAC address from the label attached to the bottom of the iServer and place it in this box.
3) Click here to send the above IP address to the iServer.
4) After the IP address is assigned to the iServer, click here to access it's web pages.
5) Click here to Ping the iServer whose IP address is shown in the IP address box.
6) Click here to find all the iServer's on your network .
7) The IP addresses for the iServer's found by the iConnect will be listed here.
8) These fields indicate the IP address and the subnet mask of the PC on which the iConnect is running.

4.1 iConnect Software (continued)

d) To access the iServer for Configuration:

Click on the “View Webpage” button, you will access the iServer’s home page, refer to **Section 4.3** for details.

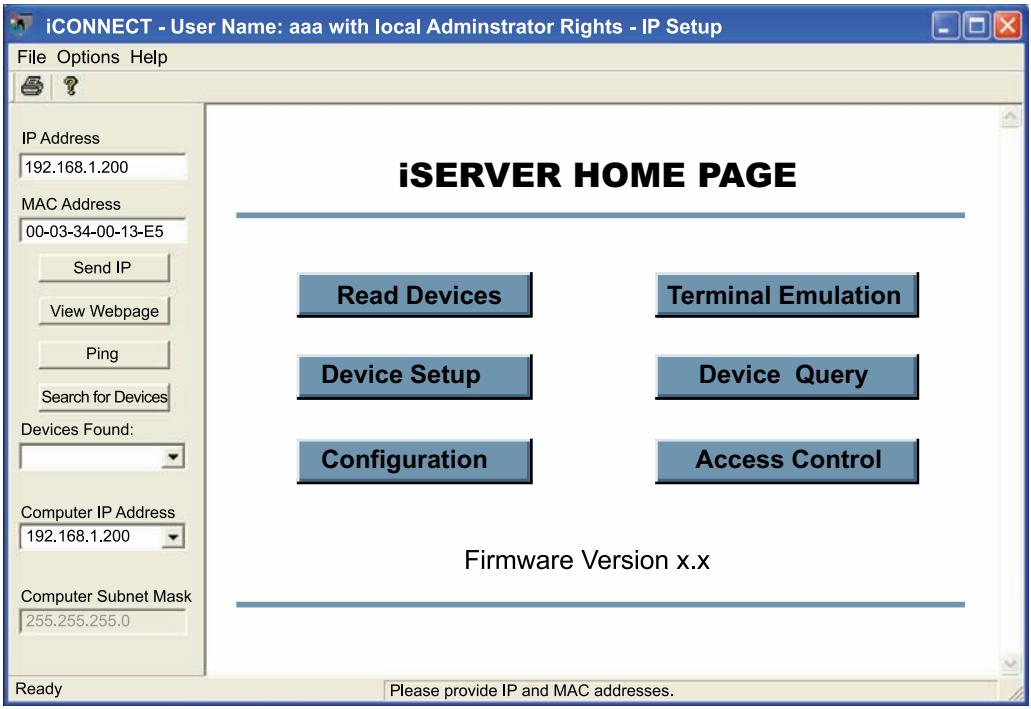


Figure 4.3 Accessing the iServer’s Home Page Menu

4.2 Setting a New IP Address over the Network

Besides using the iConnect software, you may use the iServer's default IP address to access it and assign a new IP address to it.

The iServer is shipped with a default IP address of **192.168.1.200** and Subnet Mask of **255.255.255.0**. You can configure your PC's Network connection with an IP address that is in the same range as the iServer's IP address (**192.168.1.x**) and connect to the iServer using a crossover network cable between your PC and the iServer.

With this completed, you can go to the DOS-Prompt and ping **192.168.1.200**. If you receive responses back (**Figure 4.1**), you can go to the Web browser and type in ***http://192.168.1.200*** and it will take you to the iServer's Home Page.

Select Access Control, button, you'll be asked for the password. First default LOGIN password is "**12345678**" and the ADMINISTRATOR password is "**00000000**", then you should be on the Access Control page were you can simply type in the desired Static IP address, and click Save.

For more details about the "Access Control" page refer to **Section 4.3.5.**

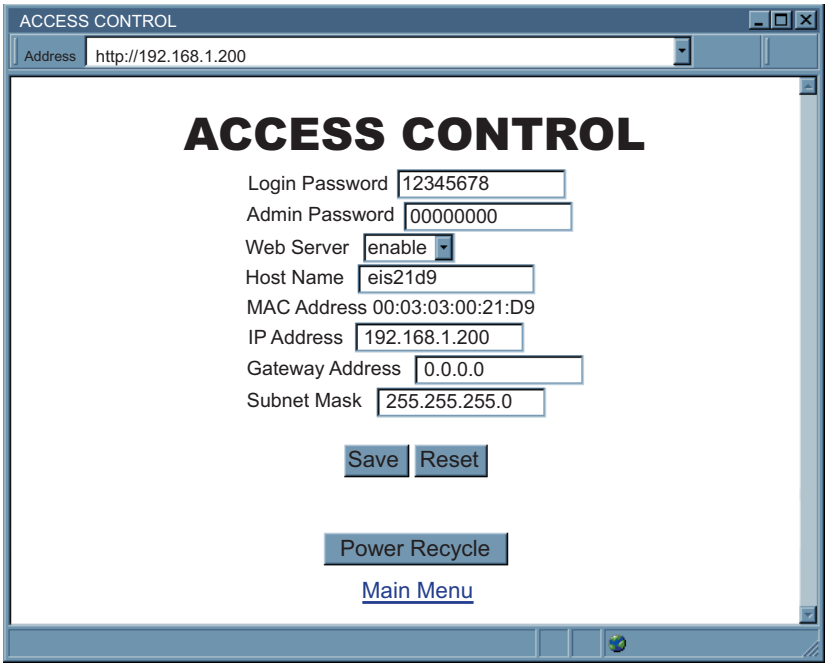


Figure 4.4 Access Control

Note

For the IP address to take effect, the iServer needs to be turned OFF/ON. Clicking the "Power Recycle" button will turn the iServer OFF and ON.

Pressing the physical button marked "RESET" on the iServer does the same thing.

You can now connect the iServer to an Ethernet hub using a straight through cable, power it up, and follow the ping routine mentioned in the previous section.

4.3 Setup and Operation Using a Web Browser

- Start your web browser.
- From the browser you type ***http://eisxxxx*** using the last four-digits from the MAC address label located on the device if DHCP and DNS are used. If a static IP address is used, then simply type ***http://x.x.x.x***, where ***x.x.x.x*** is the iServer's IP address.
- The Home Page, shown below, will be displayed.

Figure 4.5 iServer Home Page Menu

Note In order to access certain menu items of the Home Page, users may be prompted for a password, as shown in **Figure 4.6**.

Figure 4.6 LOGIN and ADMINISTRATOR Passwords

There are 2 different access levels:

1. ADMINISTRATOR Password (administrator) allows certain groups and individual users to access and modify "entire" iServer parameters without any restrictions.

   The default password is **00000000**. This password can be up to 16 alphanumeric case-sensitive characters.

2. LOGIN Password (operator) allows users to access and modify all of the iServer parameters, except "Access Control" which requires an Administrator password. The "Read Devices" does not require a password.

   The default password is **12345678**. This password can be up to 16 alphanumeric case-sensitive characters.

4.3.1 Device Setup

From the iServer Home Page, this option allows the users to add up to eight devices (in RS485 mode) and the iServer will send the entered commands out and will receive the responses from those devices. The responses can be seen by clicking on the “Take Readings” button.

Since only one device can be connected in an RS232 connection, there should be only one device entered in the “Device Setup” page.

By clicking on the numbers from **1** to **8**, the parameters for each device can be defined.

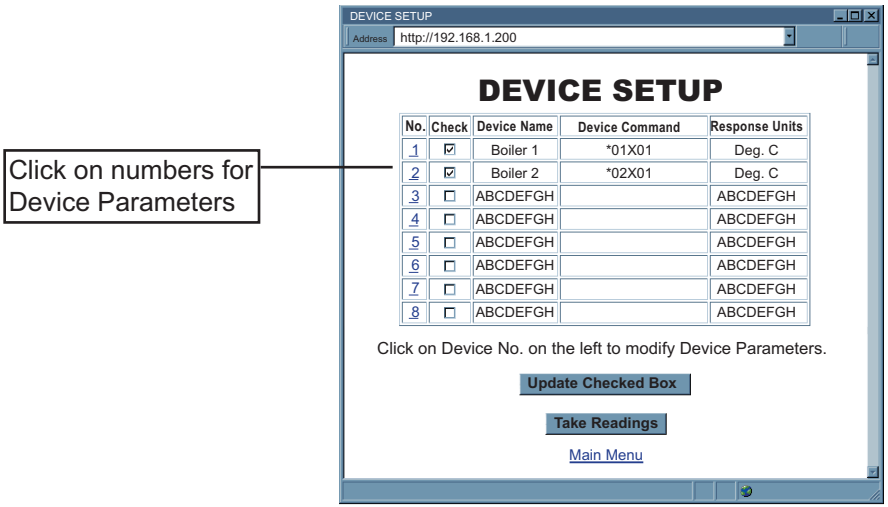

Click on numbers for Device Parameters
DEVICE SETUP
Address http://192.168.1.200
DEVICE SETUP
No. Check Device Name Device Command Response Units
1 Boiler 1 *01X01 Deg. C
2 Boiler 2 *02X01 Deg. C
3 ABCDEFGH ABCDEFGH
4 ABCDEFGH ABCDEFGH
5 ABCDEFGH ABCDEFGH
6 ABCDEFGH ABCDEFGH
7 ABCDEFGH ABCDEFGH
8 ABCDEFGH ABCDEFGH
Click on Device No. on the left to modify Device Parameters.
Update Checked Box
Take Readings
Main Menu

Figure 4.7 Device Setup

In the “Device Parameters” page the “Device Name” and the “Response Unit” fields are simply text fields and each can take up to eight alphanumeric characters. The “Device Command” field is where the actual command is typed. The iServer will send this command to the serial device as soon as the “Take Reading” button is clicked.

Note

In RS485 connection, the RS485 node number must be typed before the actual command.

Example: ***01** is the RS485 node number 1 and the **X01** is the actual command requesting temperature value.

Figure 4.8 Device Parameters

4.3.2 Read Devices

Note

From the iServer home page, when selecting “Read Devices” option, you could be prompted with the following error message.

To be able to select the “Read Devices” option, you need to click on the “Configuration” option and change “Number of Connections” to **0** (see **Figure 4.12**). Make sure to Save the page and click “Read Devices” option again.

Error
Address
http://192.168.1.200
ERROR
To view this page, disable Terminal Server option on the Configuration page, by setting the "Number of Connections" to 0.
Main Menu

Figure 4.9 Error Message

After adding the Parameters, including the “Device Command” described in the “Device Setup” page, the “Read Devices” option allows you to monitor the response back from the serial device.

If you have **000**, click the Auto Update button to manually refresh the page. If you want to change the time interval of the page refresh, enter the amount of seconds in the box.

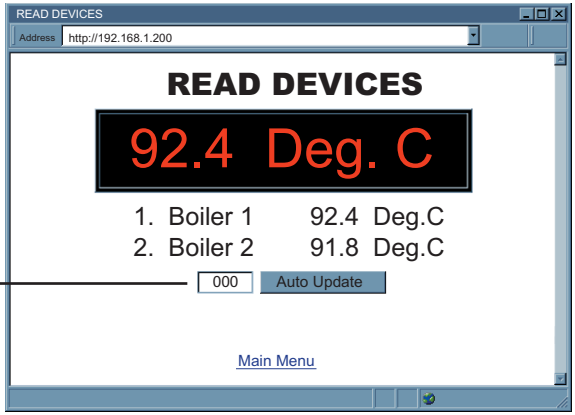


Figure 4.10 Read Devices

4.3.3 Device Query

Note

From the iServer Home Page, when selecting “Device Query” option, you could be prompted with the following error message, shown in **Figure 4.9.**

To be able to select the “Device Query” option, you need to click on the “Configuration” option and change “Number of Connections” to 0 (see **Figure 4.12**). Make sure to Save the page and click “Device Query” option again.

The “Device Query” option allows you to send a command to a single serial device connected to the iServer and displays the response back from that serial device. If the connection is RS485, the RS485 node number must be typed before the actual command.

Example: *01 is the RS485 node number 1 and the X01 is the actual command requesting temperature value.

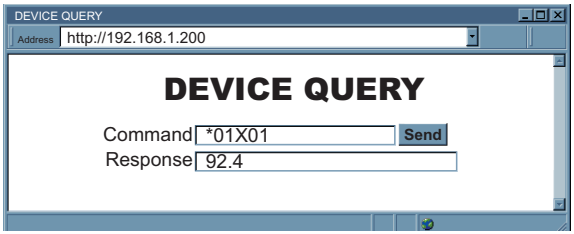


Figure 4.11 Device Query

4.3.4 Configuration

This section describes the "Configuration" page of the iServers's Web interface.

Click on Configuration, the following page should appear.

When connecting your serial device to the iServer, the Serial Communications parameters (baud rate, data bit, parity, and stop bit) must be the same on both, the iServer and your serial device.

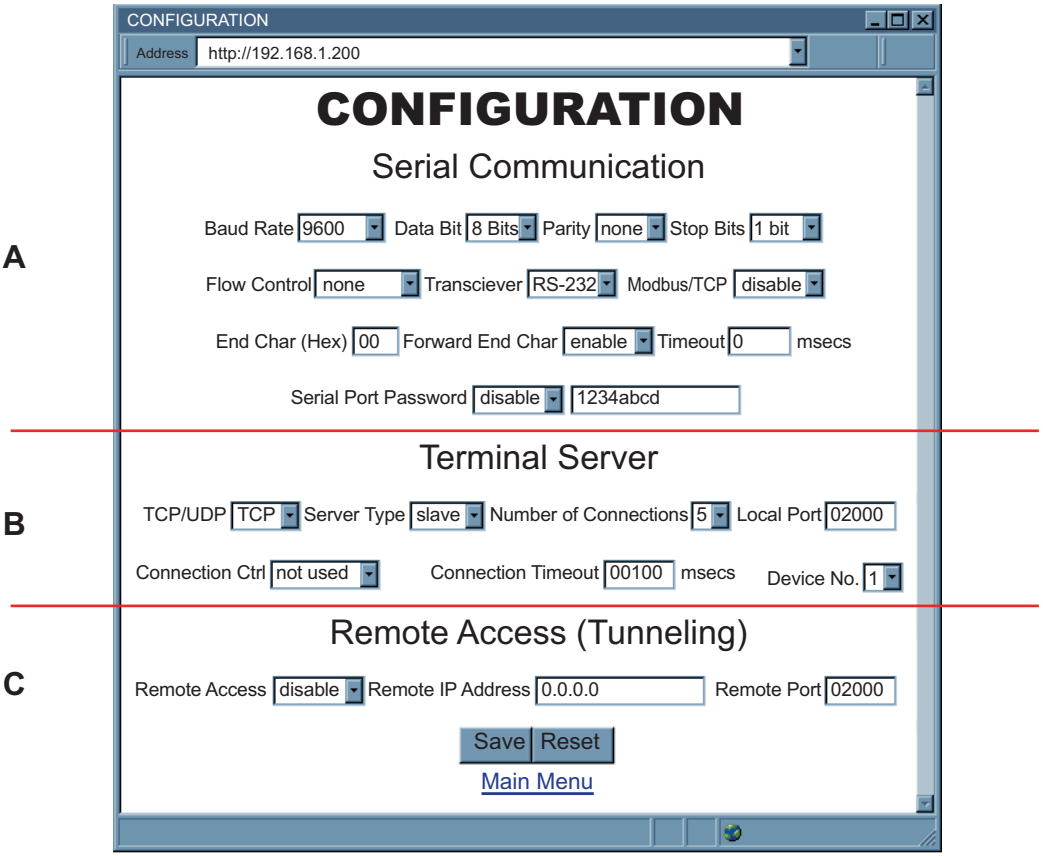


Figure 4.12 Configuration

Below are the definitions of terms used in the Configuration Page.

4.3.4.A Serial Communication

Baud Rate: The serial port speed can be set from *300* to *115,200* bits/s (default is *9600* bits/s.)

Data Bit: Options are *7* or *8* (default is *8* bits.)

Parity: Options are *Odd, Even,* and *None* (default is None.)

Stop Bits: Options are *1* and *2* bits (default is 1 bit.)

Flow Control: Options are *Software Flow Control (Xon/Xoff), Hardware Flow Control (CTS/RTS),* and *None* (default is *None*).

4.3.4.A Serial Communication (continued)

Transceiver: The iServer's DB9 serial port can either be set to *RS232* or two-wire *RS485* (default is *RS232*).

Modbus/TCP: A widely used protocol mainly in industrial automation applications with default TCP port number of 502 (see Local Port field). The options are *Enable* and *Disable*.

If *enabled*, the Modbus/TCP is the only protocol driven by the iServer on its LAN port. If *disabled*, the TCP/IP is the only protocol driven by the iServer on its LAN port (default is *disable*).

End Character: When the defined Hex character is received by the iServer on its serial port, the iServer will forward the buffered serial data to the Ethernet.

The default value is *00*, which forces the iServer to forward the data to the Ethernet as it receives the data on its serial port (this means that the iServer requires NO "end character" to forward the data).

Forward End Char: The options are *Enable* and *Disable*.

If *enabled*, the iServer will send the End Character out to the Ethernet as part of the data. If *disabled*, the iServer will not count the End Character as part of the data and will drop it (default is enabled.)

Timeout: In RS232 connection, if the iServer does not receive any more serial data within the given time value, the iServer will forward the buffered serial data to the Ethernet.

For example: if the Timeout is set to 200 ms, the iServer will send out the buffered serial data to the LAN, if it does not receive any more data on its serial port for a period of 200 ms.

In RS485 connection, the Timeout value is used to switch between serial transmit and receive mode. Since the iServer supports 2-wire RS485, it needs to either transmit or receive serial data and the Timeout value determines the time interval for each.

The range can be from 0 to 9999 ms (default is 0 ms).

Serial Port Password: The options are *Enable* and *Disable*.

The Telnet connection to the iServer's serial port (default port 2000) can be password protected if this option is enabled (default is *disable*).

If *enabled*, the actual password can be placed in the next field.

4.3.4.B Terminal Server

TCP/UDP: The iServer supports *TCP* and *UDP* protocol (default is *TCP*). If *UDP* is selected, it can be configured either for Broadcast UDP or Directed UDP.

In case of Broadcast UDP, the iServer will transmit the serial data to every node on the network. This can be accomplished if the Remote IP Address is set to **255.255.255.255**.

The Broadcast UDP is a practical solution when one device needs to communicate with multiple PC's or devices over the network (one-to-many connection).

In the case of directed UDP, the iServer will transmit the serial data to a specific node on the network (one-to-one connection). This can be accomplished if the Remote IP Address is set to the IP address of that specific node.

4.3.4B Terminal Server (continued)

Server Type: In most cases the iServer will be acting as a Slave device. *Slave* option is chosen when a network host needs to connect to the serial port of the iServer (default is *Slave*). With RS485 connection, the *Host* option is selected if the connection is initiated from the serial device targeting a node on the network.

Number of Connections: The range is from *0* to *5*.

If *0* is selected, the Terminal Server feature is disabled. This means that no network connection can be made to the serial port of the iServer.

If *1* is selected, only one network connection can be made to the iServer's serial port.

Any number more than 1 would allow the network hosts to monitor (read only) the traffic on the iServer's serial port simultaneously, but only one network host would be allowed to read and write (default is *5*).

Local Port: This is the port or socket number for the iServer's serial port. Any number between *500* and *9999* can be defined with the exceptions of *1000* and *2002* which are already used by the iServer for other purposes (default is *2000*.)

Port number *502* is the default socket number for Modbus/TCP protocol. If Modbus/TCP is enabled in the iServer, it's then suggested to use ***502*** for the Local Port unless your host software that supports Modbus/TCP indicates otherwise.

If your application software is IP enabled, it means that it can open a connection to a node on the network (i.e. iServer with the attached serial device) with an IP address and a port number.

In some cases the application software may not allow you to specify the iServer's port number (it only allows you to enter the iServer's IP address). In these cases, you should put ***23*** in the Local Port field of the iServer. By doing this, the iServer will forward connections that are made to its Ethernet port directly to its serial port.

Connection Control: Some serial devices accept connections or disconnect connections based on certain signal conditions.

For example: a serial device may accept a connection only if the incoming DTR signal (connected to device's DSR or DCD) is high or low. In this case, when the iServer receives the TCP connection, before it forwards it to its serial port, it must raise its DTR (DTR+) or to lower its DTR (DTR-). The iServer is capable of doing this with any of the hardware or modem control signals (DTR, DSR, DCD, RTS, and CTS).

"Reconnect" is one of the options in the Connection Control menu. This option can be used in the Serial Tunneling described in **Section 4.11**. If the connection in Serial Tunneling is broken due to network problems, power failure, etc., the Reconnect option will try to get the connection back on line every whatever the "Connection Timeout" is set to.

For example: if the Connection Timeout is set to 1000 x10 ms or 10 seconds, then every 10 seconds the iServer attempts to reconnect and reestablish the serial tunnel to the other network node.

Device No.: Refer to **Section 4.3.1**

4.3.4.C Remote Access (Tunneling)

Remote Access: This option needs to be *enabled* when Serial Tunneling is configured. The Serial Tunneling is explained in detail in **Section 4.11**.

Changes made in the iServer's Configuration page can be saved permanently by pressing the **Save button**.

Pressing the **Reset button** will set all the fields back to their default values.

4.3.5 Configure Access Control

This section describes the "Access Control" page of the iServers's Web interface. This page allows the users to set up the network and security parameters of the iServer.

At the initial entrance to the "Access Control" page you will be prompted for the LOGIN Password (see **Figure 4.6**) prior to an ADMINISTRATOR Password.

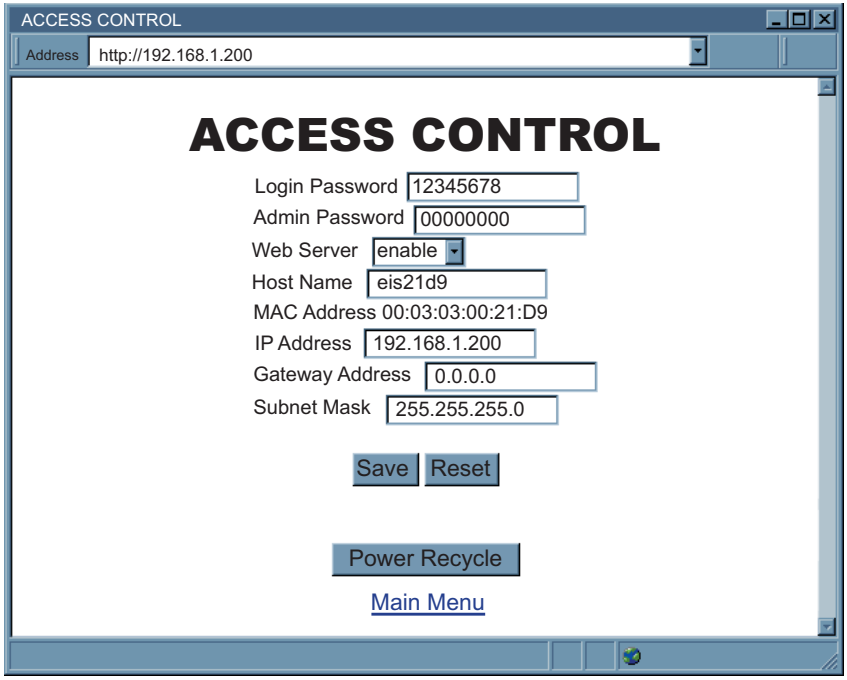


Figure 4.13 Access Control

Login Password: This allows users to access and modify all of the iServer Home Page menu items, except "Access Control", which requires an Administrator password. The default Login password is **12345678**. This password can be up to 16 alpha-numeric case-sensitive characters.

If there is no Login Password assigned (blank box) the iServer will not require a password to access and modify iServer Home page menu items.

Admin (administrator) Password: This allows users to access and modify the "Access Control" page. The default password is **00000000**. This password can be up to 16 alpha-numeric case-sensitive characters.

If there is no Administrator Password assigned (blank box) the iServer will not require password to access and modify "Access Control" page.

Web Server: This will allow or disallow accessing the iServer's Web server using an Internet browser (default is enabled.)

Host Name: Refer to **Section 3.4**, DNS.

MAC Address: This is also called Hardware address or Ethernet address, which is assigned to the iServer at production. The MAC (Media Access Control) address is the iServer's unique hardware number and is not changeable.

4.3.5 Configure Access Control (continued)

IP Address: The IP (Internet Protocol) address is a 32-bit number that identifies each sender or receiver of information that is sent in packets across the Ethernet or the Internet. The iServer's default IP address is **192.168.1.200**. The iServer's IP address should be changed to fit user's networking environment. Consult with your IT department for obtaining an IP address.

The DHCP will be enabled in the iServer if its IP address is set to **0.0.0.0**.

The DHCP can also be enabled by setting the DIP switch **# 3** to **ON** position.

Gateway Address: A gateway is a network point that acts as an entrance to another network. A gateway is often associated with a router, which knows where to direct a given packet of data that arrives at the gateway. If the iServer is sending packets to another network node that is not on the same network on which the iServer is connected, a gateway address needs to be given to the iServer. The gateway address should be the IP address of the router connected to the same LAN to which the iServer is connected. The iServer's default gateway address is **0.0.0.0**.

Consult with your IT department for obtaining a gateway address.

Subnet Mask: It's a 32-bit number that is used to determine which part of the IP address is the network portion and which part is the host portion. The iServer's default subnet mask is **255.255.255.0**.

Consult with your IT department for obtaining a subnet mask.

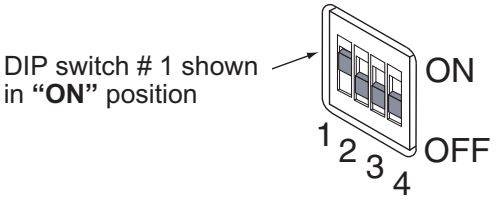
Changes made in the iServer's Access Control page can be saved permanently by pressing the **Save** button *and* Power Recycling the iServer (press Power Recycle button).

Pressing the **Reset** button will set all the fields back to their default values.

4.4 Setting a New IP Address using the Serial Port

Once you know the IP address that you need to put on your iServer you can use a serial connection (Terminal Emulation) to assign the IP address to the iServer.

Setting the IP address over the serial port requires a crossed-over (null modem) serial cable and Hyper Terminal or any terminal emulation program. When all the connections are done, change the DIP switch **#1** to **"ON"** position and press the Reset button or reset the power on the iServer. The Hyper Terminal screen will acknowledge your connection by asking for the command.



Note ☞ Sending three "Control A" characters will do the same as setting DIP switch **#1** to **ON** position. Once the "Ctrl A" characters are received by the iServer, the Serial Port will switch to "Command" mode.

Figure 4.14 DIP switch #1

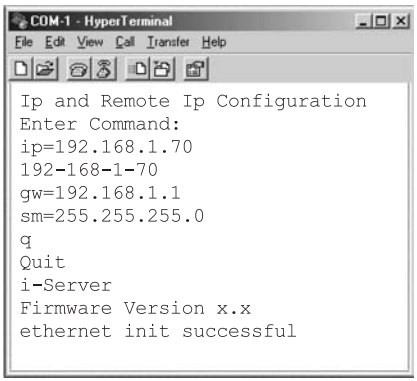
Type "**IP=xxx.xxx.xxx.xxx**" and press Enter.

The screen will acknowledge that your command was executed.

You can also set the iServer's gateway and subnet mask by typing "**GW=xxx.xxx.xxx.xxx**" and "**SM=xxx.xxx.xxx.xxx**", respectively.

Then type **q** and press Enter

You can now change the DIP switch **#1** back to the **"OFF"** position and reset the power on the iServer.



Note ☞ You need to make sure to setup the following parameters on your terminal emulation program (i.e. Hyper Terminal)

Baud Rate	-	9600 b/s
Data Bit	-	8 bits
Parity	-	None
Stop Bit	-	1 bit
Flow Control	-	None
Local Echo	-	Enable
Line Feeds	-	Enable

Figure 4.15 Setting the IP address via the Serial Port

Note ☞ You can access the iServer's complete settings by connecting the iServer's serial port to your PC's COM port using a null-modem cable.

Bring up a terminal emulation program (i.e. HyperTerminal) and make sure the right COM port is selected and the serial communications settings (baud rate, character bit, stop bit, and parity) match the iServer's serial port.

Power the iServer **ON** and press the Enter key *within 5 seconds* of powering the iServer.

The iServer will then transmit its complete configurations to the PC.

4.4 Setting a New IP Address using the Serial Port (continued)

All that is left for you to do, is to use a straight/normal network cable to connect the iServer to an Ethernet hub and power it up.

Then you can go to your computer that is connected to the same network and from the MS-DOS-Prompt window type "**ping 192.168.1.70**" where 192.168.1.70 is the new IP address for the iServer.

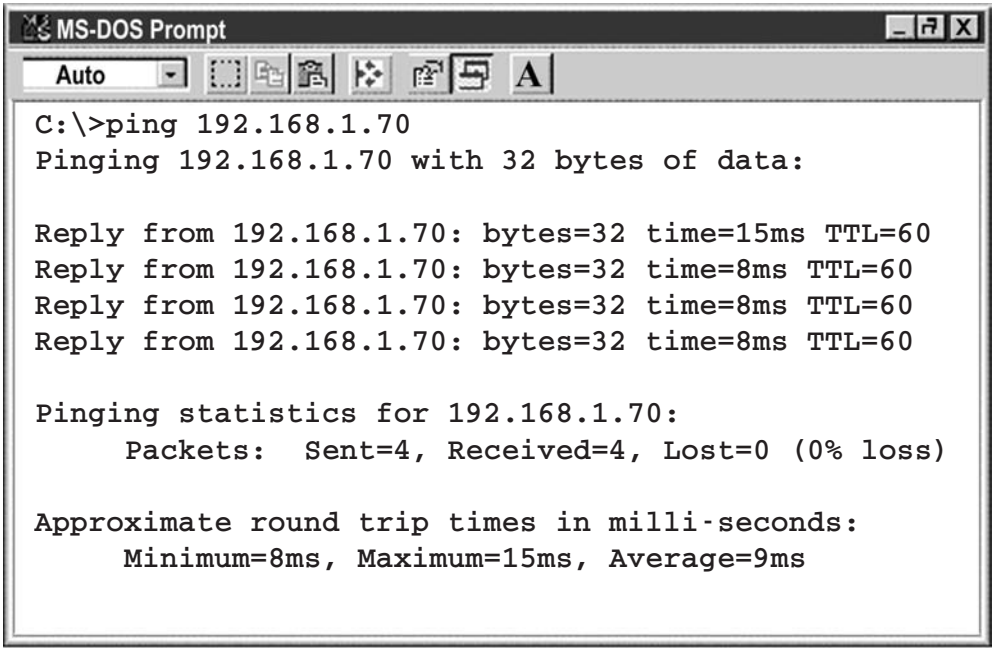

MS-DOS Prompt
Auto
C:\>ping 192.168.1.70
Pinging 192.168.1.70 with 32 bytes of data:
Reply from 192.168.1.70: bytes=32 time=15ms TTL=60
Reply from 192.168.1.70: bytes=32 time=8ms TTL=60
Reply from 192.168.1.70: bytes=32 time=8ms TTL=60
Reply from 192.168.1.70: bytes=32 time=8ms TTL=60
Pinging statistics for 192.168.1.70:
Packets: Sent=4, Received=4, Lost=0 (0% loss)
Approximate round trip times in milli-seconds:
Minimum=8ms, Maximum=15ms, Average=9ms

Figure 4.16 Pinging 192.168.1.70 from the MS-DOS Prompt

This proves that the connection is proper and you can access the iServer using the Telnet or Web browser.

4.5 Terminal Server Function

This is used to provide dedicated connectivity between computers and serial devices through the iServer over the Ethernet, without dedicated wiring.

The typical Internet protocol consists of a request and a reply to that request. In this situation the server is the Host that generates the request and receives the reply from the device, that gets forwarded to the appropriate party on the network. But there are specific applications where a message is generated by the device, and the server is simply passing the data to the appropriate party on the network, in this situation the server acts as Slave.

Examples are: Attendance Time Clocks, Bar Code Readers, remote Displays or Electronic signboards, etc.

For the iServer to pass the data back and forth between its Serial and Ethernet interfaces, the Terminal Server option needs to be configured as follows (**Figure 4.17**):

1. Set the Server Type to **Slave**
2. Set the Number of Connections to **1** or higher.
3. Set the **Local Port** number to any number from 599 to 9999, except numbers 1000 and 2002.
4. Press the **Save** button to store the new settings.

From your application software on the host machine, you can now point to the IP address of the iServer and the assigned port number to establish a TCP connection to your serial device connected to the serial port of the iServer.

Note If DIP switch **#4** is **"ON"**, Terminal Server function is always enabled, regardless of the firmware configuration.

By default, this DIP switch is set to "OFF" position.

You have the option to enable the Terminal Server feature either through the firmware or the DIP switch **#4**.

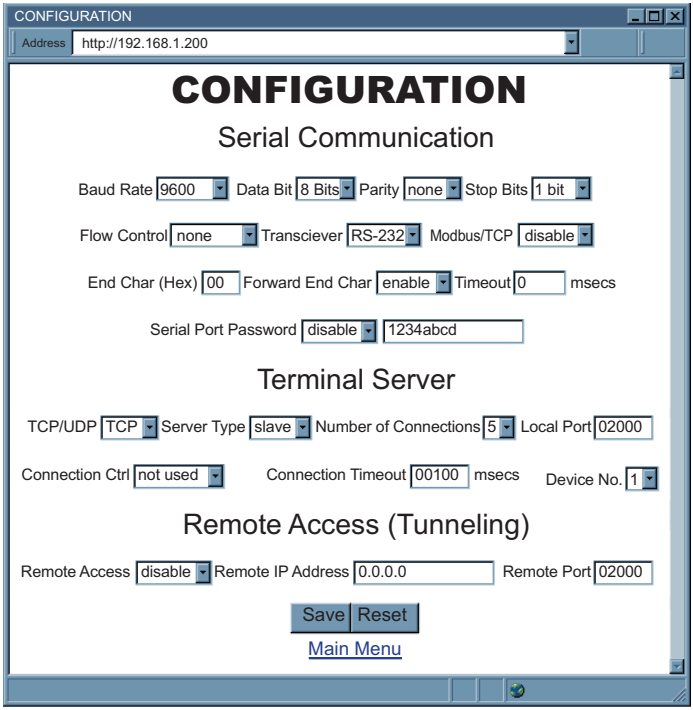


Figure 4.17 Terminal Server Configuration

4.6 Terminal Emulation

On this page you can send and receive data to and from the serial device. Simply, type the command in the white area and as you type the characters, the characters will be transmitted out from the serial port of the iServer. If you want to send the whole command as a word, simple paste the word in the same area. This is an excellent tool to retrieve data from the serial port without any special software, only a web browser.

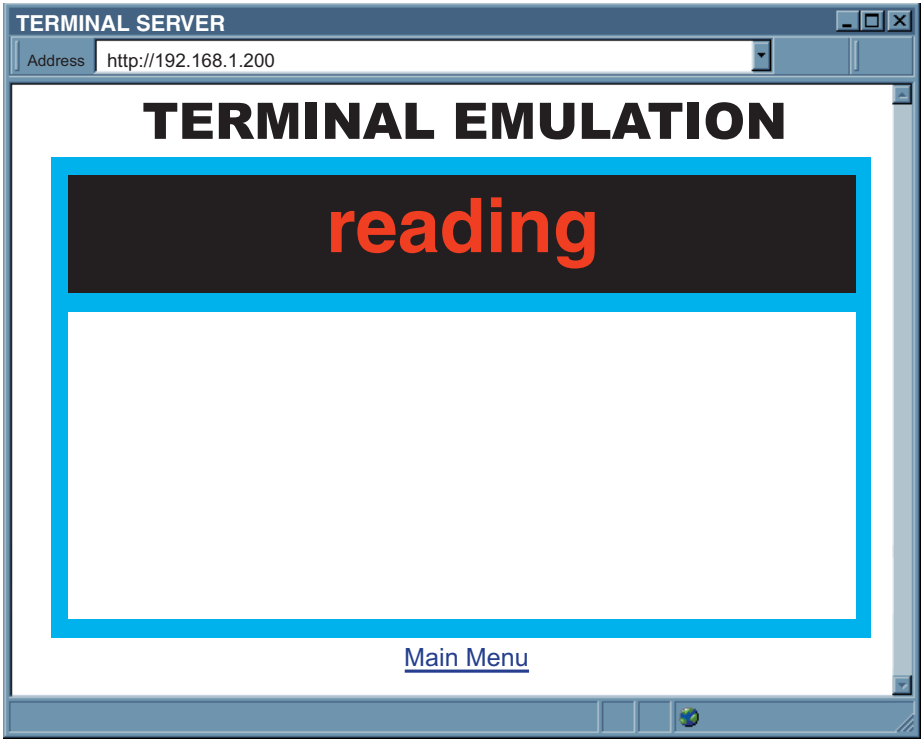


Figure 4.18 Terminal Emulation

4.7 Telnet Setup

Telnet stands for Telecommunications Network, it is a protocol that provides a way for users (or clients) to connect to computers (or servers) on a network, whether in the next building or across the other side of the world.

You can open a Telnet session using other terminal emulation programs like Tera Term Pro (downloadable from the internet), which is a free software for MS-Windows. It supports VT100 emulation, Telnet connection and serial port connection.

Once the Telnet mechanism is decided we can open a session by simply typing the IP address of the iServer, and setting the Port on **2002** for logging into the iServer Configuration page or **2000** for accessing the serial device connected to the iServer's serial port.

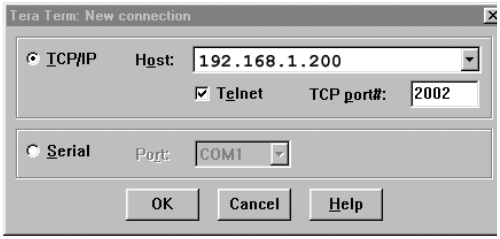


Figure 4.19
Tera Term Telnet Connection Screen

```
Firmware Version 4.1
Admin. Password:00000000
Admin. Login Successful
p                    Configuration
                     Firmware Version 4.1
BD  =    9600 (5)
PT  =    none(0)
ST  =    1 bit (0)
DT  =    8 bits (1)
MD  =    RS-232 (0)
TO  =    0000
TT  =    SLAVE(1)
TN  =    5
HN  =    eis1376
IP  =    192.168.1.200
LP  =    12345678
SP  =    00000000
TP  =    iServer(0)
RE  =    disable(0)
RI  =    0.0.0.0
RP  =    02000
GW  =    0.0.0.0
SM  =    255.255.255.0
EC  =    00
PP  =    02000
FC  =    none (0)
MB  =    disable(0)
TU  =    TCP (0)
CC  =    not used(0)
CT  =    01000
FE  =    enable (1)
EP  =    disable(0)
CP  =    1234abcd
WB  =    enable (1)
MAC      =        00:03:34:00:13:76
q
Quit
```

Figure 4.20 Telnet Setup
iServer Configuration Page

Note The default password for Telnet Login is and can be changed if desired. Telnet works only in RS232 mode

4.7 Telnet Setup (continued)

In the Configuration mode you can make any changes just like you would do using the Web Browser. After connected to the iServer, the user can use the following commands to read, modify, and get help from the iServer console.

? Following with a return character, the console will show all the commands and options (**Figure 4.21**).

p Following with a return character, the console will show the iServer configurations (**Figure 4.20**).

s Is the configuration command, used to set a new setting (see the example in **Figure 4.21**)

r This command is used to read the status of the digital I/O signals (0 is low and 1 is high)

Example: r DCD response will be DCD (DSR)=0
r DTR response will be DTR=0

w This command is used to change the status of the digital I/O signals (applies only to the outgoing signals, DTR and RTS)

Example: w RTS=1 means raise the RTS
w DTR=0 means lower the DTR

RESET following with a return character, it will recycle the Power on the iServer.

FACTORY following with a return character, it will set the iServer to it's factory default settings.

```
Admin. Password:00000000
Admin. Login Successful
  iServer Configuration Command:
?
cc description                  ppppp
BD BaudRate                     0-300,1-600,2-1200,3-2400,4-4800,5-9600,6-19200,
                                7-38400, 8-57600, 9-115200
PT Parity                       0-none,1-Odd,2-even
ST StopBits                     0-1bits,1-2bits
DT DataBits                     0-7bits,1-8bits
FC FlowControl                  0-none,1-XON/XOFF,2-Hardware
MD Mode                         0-RS232, 1-RS485
MB Modbus/TCP                   0-disable, 1-enable
TO TimeOut                      xxxx ms Rang range 100-9999
TU TCP/UDP                      0-TCP, 1-UDP
TT TerminalType                 0-Host, 1-Slave
TN TerminalNumber               0-5
PP TerminalPort                 XXXXX 500-65535 but 1000 and 2002
HN HostName                     XXXXXXXX    maxim 18 characters
IP Static IP                    XXX.XXX.XXX.XXX
LP Login Password               XXXXXX maxim 16 characters
SP Admin Password               XXXXXX maxim 16 characters
TP Device Type                  0-iServer,1-iDRN,2-iDRX,3-iSeries,4-iNFB,5-iLD
RE Remote Enable                0-Disable, 1-Enable
RI Remote IP                    XXX.XXX.XXX.XXX
RP Remote Port                  XXXXX 500-65535 but 1000 and 2002
GW Gateway                      XXX.XXX.XXX.XXX
EC End Char                     XX represents the Hex Num. of ASCII. i.e 0D means CR
                                (Carrige Return)
FE Forward End Char             0-disabled, 1-enabled
EP Enable Serial Port Password        0-disabled, 1-enabled
CP Serial Port Password       XXXXXX maxim 16 characters
CC Connect CTRL                 0-not used,1-RTS+,2-RTS-,3-CTS+,4-CTS_,5-RTS-CTS+,
                                6-RTS-CTS-, 7-DTS+,8-DTR-, 9-DCD/DSR+,
                                A-DCD/DSR-, B-DTR-DCD+, C-DTR-DCD-, D-RECONNECT
CT Connect Timeout              XXXXX 1-65535
WB Web Server                   0-disable, 1-enable
Example:
To configure Baudrate 9600, 1 stop bit, Odd Parity, and RS232 mode.
s -BD5 -PT1 -ST1 -MD0
```

Figure 4.21 Telnet Setup - iServer Help Page

4.8 HTTPget Program

The HTTPget software is used to send a single HTTP or TCP request to an iServer product. In contrast, the telnet or Hyperterminal programs allow a continuous connection with multiple requests to be sent to the iServer product.

Generally HTTPget is used for simply programming an IP address to the iServer or for quickly obtaining a reading of from a device.

The iServer product must be configured from the configuration web page so that the "Server Type" value is set to "Command" (this is positioned under the heading of Terminal Server).

The *Number of Connections* may need to be set to "0" to enable Port 1000 (Port 1000 is for access in a non-standard terminal mode).

To use Port 2000 access (where "2000" is the value stored in "Port"), the *Number of Connections* should be set to "2" for general usage.

The value of 2 can later be changed to a value from 1 to 5 depending on needs for secure access or fault tolerance.

Whenever Terminal Server service (using Port 2000 by default) is required, the *Number of Connections* must be set to a value from 1 to 5. The Terminal Server mode is the recommended mode for the most reliable connection when operating with our software or with other programs supporting TCPIP communications.

The Port 1000 access can be used with our software and may be needed with some iServer products when you need to view readings from the web page while simultaneously collecting data through TCPIP communications.

4.8.1 HTTPget Program using Port 1000

You can setup and read the information from the iServer by using the HTTPget program. The following program can be used to read data from the serial device connected to the iServer by using TCP port **1000**. The command string is sent to this TCP port, then the response can be read back from the same port.

The iServer does not add to, or subtract from, the data, it is simply passing it between the network and the serial ports.

The HTTPget.exe file is used to setup and read information from the iServer. This file will be automatically installed when you install the Mail Notifier software available on our website and CD.

In order to use port **1000**, in the Configuration page of the iServer you must set “Number of Connections” to **0**.

In this case the port number will change to **1000** regardless of what the port number already is.

Notes on using **HTTPget** :

The HTTPget.exe program is installed to the windows directory (usually c:\winnt or c:\windows) when installing the Mail Notifier software.

1. Open up a command window (or have a DOS window)
   a) Click on start menu
   b) Click on "Run"
   c) In the dialog box that appears, type "cmd" or "command" and click on "OK" button.
   d) A command window should now appear.

4.8.1 HTTPget Program using Port 1000 (continued)

2. If you now type "httpget" and press the "enter" key, the program options should be displayed.
3. Next run HTTPget with the options displayed below

httpget –r –S "*01X01\r" 192.168.1.200:1000

where:

"-r –S" are parameters needed for the command string

"*01" is device address (in hex format) for RS485 communication interface (skip for RS232)

"X01" read measurement data value (iSeries protocol)

"\r" is the carriage return termination character

"192.168.1.200" is an IP address

"1000" is a local port number

Response: 01X01074.3

where:

"01X01" is Echo command

"074.3" is a display reading of the 4-digit device

In the example above the 4-digit iSeries controller has been connected to the serial communication port of iServer.

4.8.2 HTTPget and ARP to Setup Device IP Address

Tip ☞ Use the **iConnect** software, which may be downloaded from our website, to do these IP changes whenever possible.

Use ARP first to assign the mac address to a static IP address in computer arp table by this command:

arp –s 192.168.1.200 00-03-34-00-06-b6

Then use the following command to assign new IP to the device:

httpget –r –S "00000000" 192.168.1.200:1

where:

"**0000000**" is admin. password. If the password is wrong, the unit will ignore the new IP. If the new IP is taken, you will get the message " New IP is Assigned" after the HTTPget command. The device will reset automatically.

"**192.168.1.200**" is an example of an IP address. It is replaced with IP address suitable for your network

"**00-03-34-00-06-b6**" is replaced with your iServer product MAC address.

4.9 ARP Protocol

ARP is the Internet layer protocol responsible for matching or obtaining the MAC (hardware) address that corresponds to a particular IP address. The ARP command allows the user to view the current contents of the ARP cache of the local computer (residing on the same network).

Microsoft includes the ARP.EXE utility for viewing and modifying the ARP cache with its Windows products. The following ARP commands can be used to view cache entries:

- **arp –a** → Use this command to view all ARP cache entries.
- **arp –a** plus **IP address** → Use this command to view ARP cache entries associated with one particular interface on a network with multiple adapters.
- **arp –g** → Same as arp –a.
- **arp –N** → Use this command to display ARP entries for specific network interface.
- **arp – s** plus **IP address** plus **Physical address** → Use this command to manually add a permanent static entry to the ARP cache.
- **arp –d** → Use this command to manually delete a static entry.

Note ☞ Ping the destination computer using IP address first before using the arp -a command.

4.9 ARP Protocol (continued)

The following window shows examples of arp commands and responses.

- Your computer has an IP address of **192.168.1.118**
- The destination computer has an IP address of **192.168.1.96**

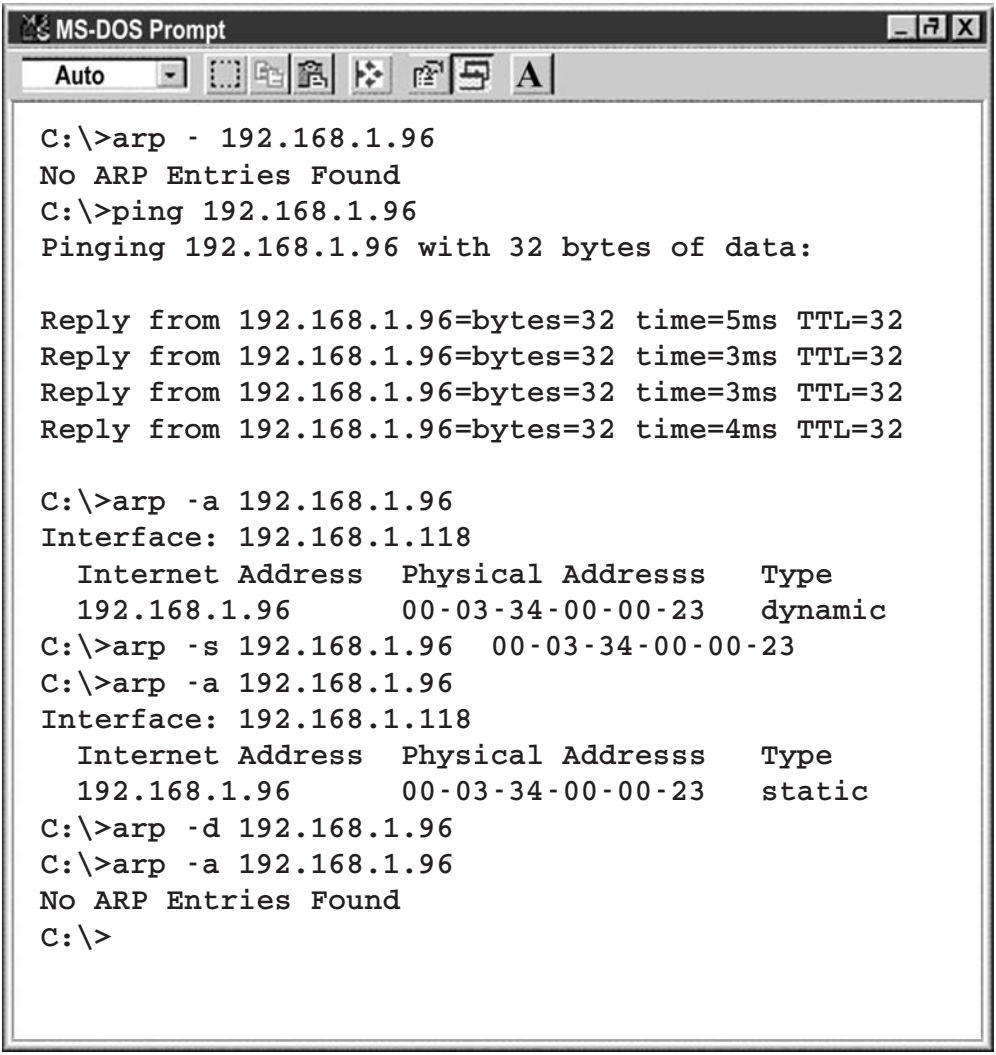


Figure 4.22 ARP Commands and Responses

4.10 Remote Access (Tunneling)

To "tunnel", in this context, is to transmit data between two points through a private conduit on a shared or public network. The network could be an Ethernet LAN, a WAN, or the Internet. The iServer allows for a connection between a serial device and a PC, or between two serial devices, using an existing network rather than dedicated wiring.

Today, there are number of serial devices like sensors, gauges, PLCs, card readers, security alarms, barcode scanners, data loggers, video cameras, ATM machines, time & attendance terminals, medical lab equipments, electronic signboards, and many others that are directly connected to PCs via their serial ports. These devices can be attached to shared Ethernet networks (TCP/IP protocol) and get accessed, controlled, and managed remotely using the iServer products. Any two iServer's can talk to each other over the Ethernet LAN, WAN, and Internet using TCP/IP protocol. Therefore, the connected serial devices to iServer's can also communicate with each other back and forth over these networks. This characteristic is called Tunneling and it's illustrated in **Figures 4.23 and 4.24**.

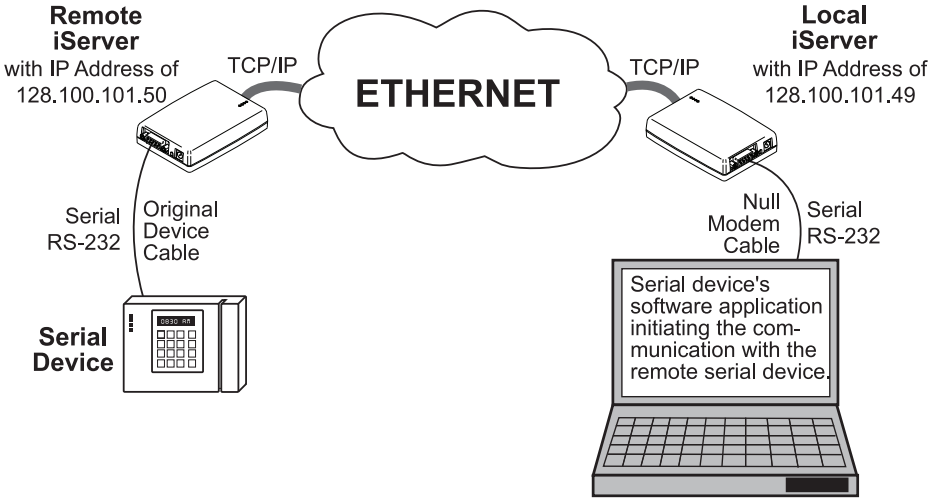


Figure 4.23 Serial Tunneling

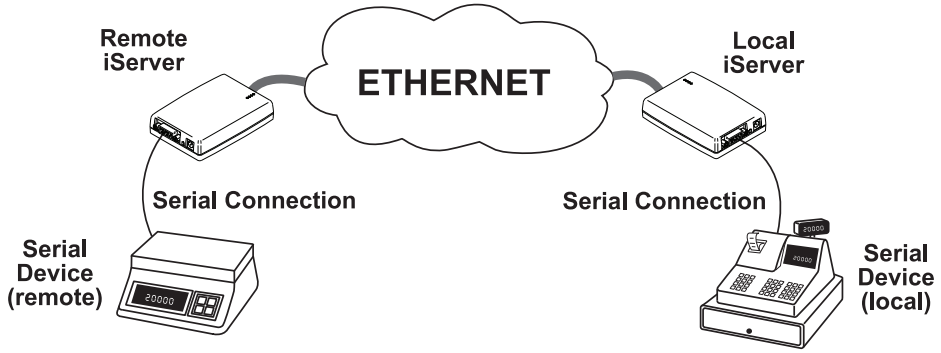


Figure 4.24 Device-to-Device Communication

In order to use this Tunneling feature, some settings are required within the local and remote iServer's.

4.10.1 Remote iServer

It's recommended to configure the Remote iServer and have it up and running before the Local iServer is configured.

1. A static IP address must be assigned to the Remote iServer. This means that the DHCP must remain disabled. Refer to the DHCP section of the user's manual for details.
2. Use a browser to access the Remote iServer's WEB page. Simply type the iServer's IP address at the browser's URL location (i.e. **192.168.1.50**) followed by an **Enter** key. You should then see the iServer's main WEB page.
3. Click on the **Update** button.
4. Click on **Configuration**, you will be prompted with a **Password** (default is **12345678**).
5. On the **Configuration** page, under **Serial Communication** section, make sure the parameters such as Baud Rate, Data Bits, Parity, Stop Bits, Flow Control, etc. match with your attached serial device.
6. Make sure to set the **End Character (Hex)** to **00** and the **Timeout** to **0**.
7. Under **Terminal Server** section, set **Number of Connections** to **1** or **higher**.
8. Click on **Save** button for the changes to take place.

Make sure that the serial cable and communication settings between the iServer and the serial device are valid.

Note **Figure 4.25** shows the valid values that need to be set in the Remote iServer. The Baud Rate, Data Bits, Parity, Stop Bits, Flow Control, and Transceiver values depend on what the serial device supports.

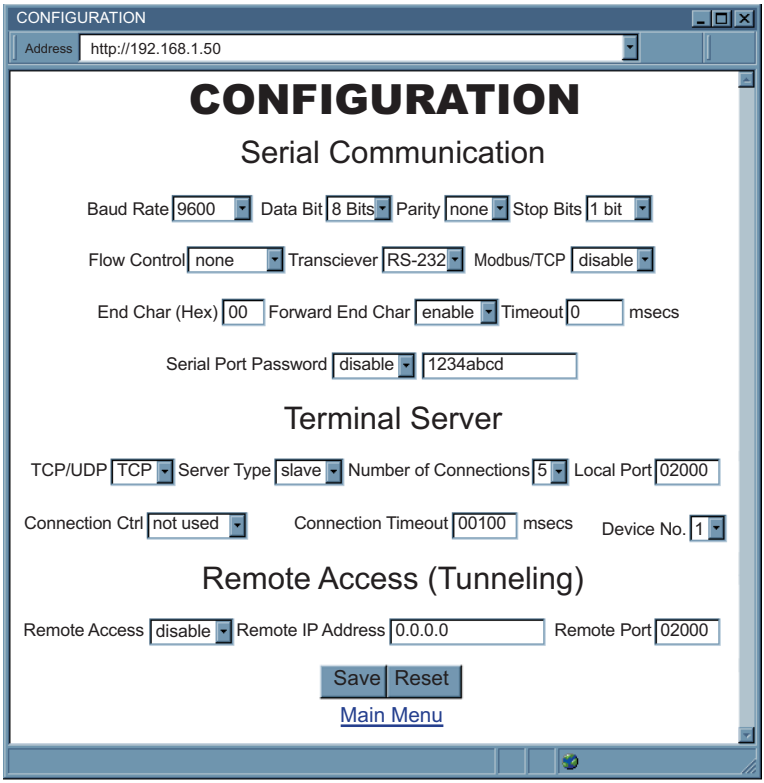


Figure 4.25 Configuration Page - Remote iServer

4.10.2 Local iServer

1. An IP address should be assigned to the iServer dynamically or statically (recommended).
2. Use a browser to access the Local iServer's WEB page. Simply type the iServer's IP address at the browser's URL location (i.e. **192.168.1.49**) followed by an **Enter** key. You should then see the iServer's main WEB page.
3. Click on the **Update** button.
4. Click on **Configuration**, you will be prompted with a **Password** (default is 12345678).
5. On the **Configuration** page, under **Serial Communication** section, make sure the parameters such as Baud Rate, Data Bits, Parity, Stop Bits, Flow Control, etc. match with your attached serial device and its application software.
6. Make sure to set the **End Character (Hex)** to **00** and the **Timeout** to **0**.
7. Under **Terminal Server** section, set **Number of Connections** to **0**.
8. Under **Remote Access** section, set the **Remote Access** to **enable**, Enter the **Remote IP address** (would be the IP address of the remote iServer, **192.168.1.50**), and use the default **Remote Port** number **2000**.
9. Set **Connection Control** to **Reconnect** and set the **Connection Timeout** to a desired value.

Note The **Reconnect** option is used in Serial Tunneling and it applies only to the Local iServer. If the tunneling connection between the two iServers goes down due to network problems, power failure, etc., the Reconnect option will enable the Local iServer to reconnect with the Remote iServer based on the specified time interval in the **Connection Timeout**. For example, based on a timeout of 1000 x 10 ms (10 seconds), the Local iServer will continually attempt to reconnect and re-establish the tunnel with the Remote iServer every 10 seconds.

10. Click on **Save** button for the changes to take place.
11. Initialize the serial device application software to establish the connection.

Note **Figure 4.26** shows the valid values that need to be set in the Local iServer. The Baud Rate, Data Bits, Parity, Stop Bits, Flow Control, and Transceiver values depend on what the attached device to the iServer supports.

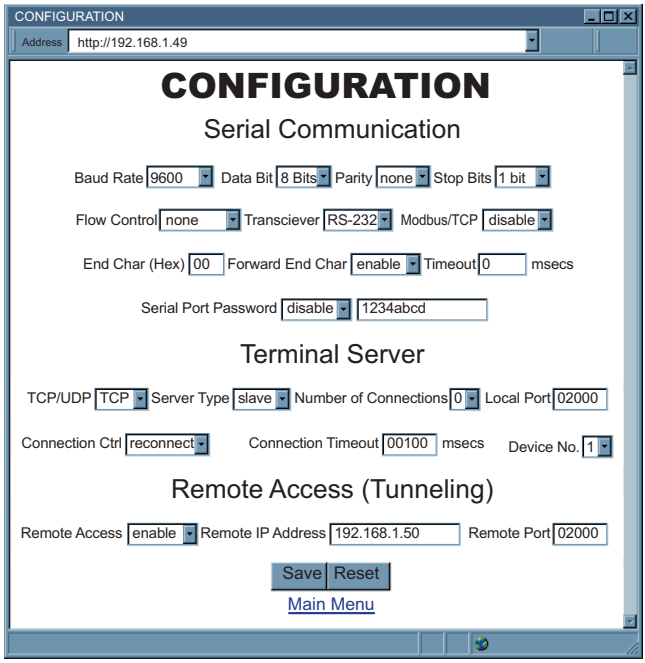

CONFIGURATION
Address http://192.168.1.49
CONFIGURATION
Serial Communication
Baud Rate 9600 Data Bit 8 Bits Parity none Stop Bits 1 bit
Flow Control none Transciever RS-232 Modbus/TCP disable
End Char (Hex) 00 Forward End Char enable Timeout 0 msecs
Serial Port Password disable 1234abcd
Terminal Server
TCP/UDP TCP Server Type slave Number of Connections 0 Local Port 02000
Connection Ctrl reconnect Connection Timeout 00100 msecs Device No. 1
Remote Access (Tunneling)
Remote Access enable Remote IP Address 192.168.1.50 Remote Port 02000
Save Reset
Main Menu

Figure 4.26 Configuration Page - Local iServer

4.10.3 Tunneling Troubleshooting

Using the original serial cable, please confirm valid communication between the serial device and its application software on the PC with no iServers in between (direct serial connection).

A successful connection is evident when the Remote Access drop down menu in the Configuration page shows enable. This proves that the Serial Tunnel between the two iServers is up and running. Otherwise, reset the power, first on the remote iServer and then on the local iServer and recheck for Remote Access drop down menu as enable.

A quick way to check the LAN and serial tunneling connection is to separately access each iServer WEB page via the Ethernet. If successful, this should prove a valid LAN connection.

For serial tunneling, open a HyperTerminal session on the PC pointing to the same COM port to which the Local iServer is connected and type/send some characters. This should cause the Rx LED on the Local iServer to blink as it receives the data from the serial port and onto the LAN. Accordingly, the Tx LED on the Remote iServer should blink as it transmits the data from the LAN into the serial device. If no LEDs blink, then that could possibly point to the iServer connection in trouble - particularly, the serial cabling and/or the serial settings (Baud rate, stop bit, parity, etc.) throughout the communication path between the PC, the iServer, and the serial device.

4.11 iPORT, COM Port Redirector

To obtain the iPORT software (iPORT.exe file) please use the phone number, as listed on the cover of this manual, to contact the Sales Department nearest you.

To install the iPORT application, simply double-click on the iPORT.exe file and follow the installation steps. The iPORT is compatible with Windows NT, 2000, and XP operating systems.

4.11.1 iPORT Overview

The iPORT is a COM port redirecting software for Windows NT, 2000, and XP. Its function is to redirect connections that are destined for a local serial (COM) port on a PC, to an iServer network-enabling device on the LAN. In a direct serial connection, application software can communicate directly over an RS232 or RS485 with a serial device **(Figure 4.27)**.

By installing iPORT software on the same PC, the iPORT will redirect the serial connection from the COM port to the network port on that PC. The connection can simply reach the serial device through an iServer sitting anywhere on an Ethernet network **(Figure 4.28)**. This connection redirection is totally transparent to the serial device and its application software. Once the connection is up from the PC to the serial device, the data is transmitted across the Ethernet network to the serial device and back from the serial device to the PC, all through the iServer and the iPORT.

4.11.1 iPORT Overview (continued)

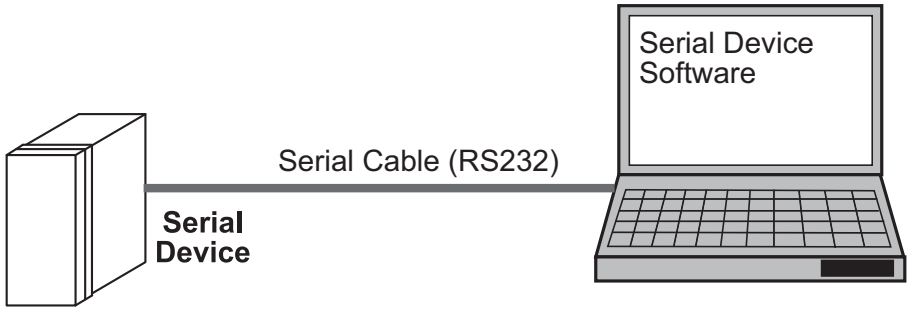


Figure 4.27 Direct Serial Connection

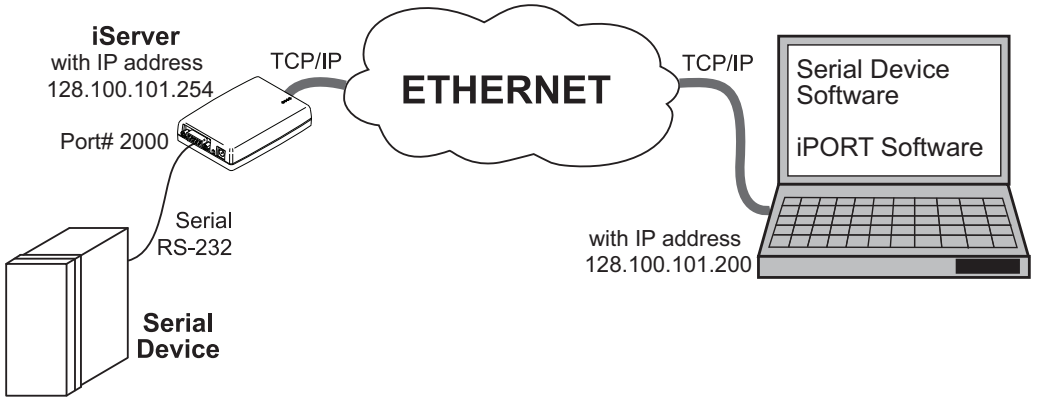


Figure 4.28 Redirect Serial Connection

4.11.2 iPORT Configurations

After the iPORT is successfully installed on your windows machine, you will have an iPORT icon on your desktop and Control Panel window. By double-clicking on this icon, you can start the application and the iPORT main window will appear on your screen **(Figure 4.29)**.

Click on "COM Ports" button and you will see the window on **Figure 4.30**. Select the appropriate COM port (this should be the same COM port that your application software uses). The selected COM port will then appear on the main iPORT window. By highlighting the selected COM port, you will be able to add the IP address and the port number to connect that COM port to the iServer on the network.

Up to 255 COM ports can be selected and each can have a different IP configuration pointing to different iServers on the network. This enables users to simultaneously redirect different application software to connect to serial devices attached to networked iServers.

4.11.2 iPORT Configurations (continued)

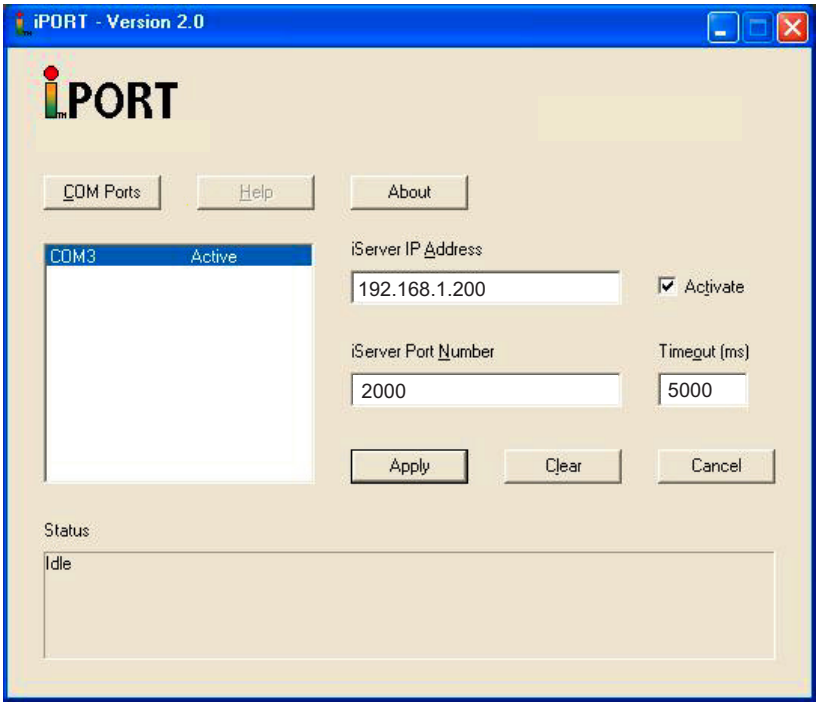


Figure 4.29 iPORT Main Window

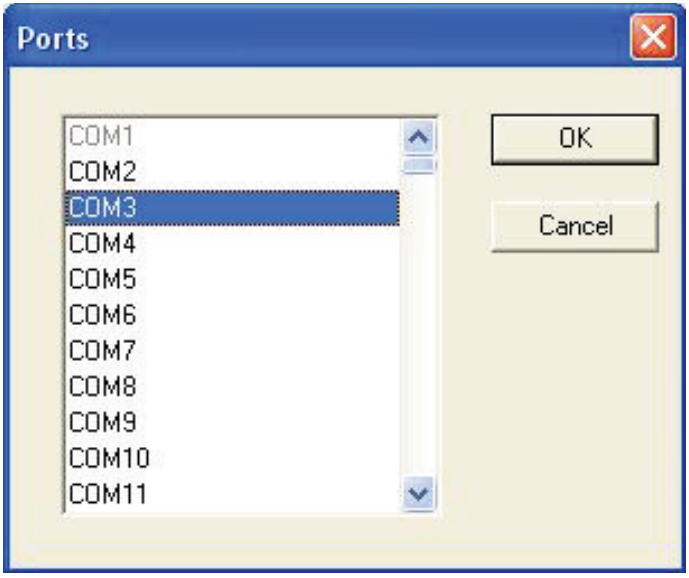


Figure 4.30 COM Port Window

4.11.2 iPORT Configurations (continued)

iServer IP Address – This is the IP address of the iServer that is connected to the serial device on one end and attached to the Ethernet LAN on the other end. The iServer's default IP address is **192.168.1.200**, which can be changed to fit your network IP address range (see **Section 3.5**).

iServer Port Number – This is the port number for the iServer's local serial port. The default value is 2000. If this port number is changed in the iServer's Configuration page (see **Section 4.3.4**), the same number should be placed in the iPORT window.

Activate – If this box is checked, the selected COM port will be available for network connection. If it is unchecked, the selected COM port will be in sleep mode.

Timeout – This is the amount of time (in milliseconds) in which the iPORT keeps the application software waiting before the device response is arrived. The default value is 5 seconds and it can be set between 0 to 10 seconds.

Status – This window shows the connection status as the iPORT makes connection to the iServer or disconnects from the iServer. The connection status can be ideal, connecting, connected, or disconnected along with the IP address of the iServer shown in the Status window.

Apply button – To save the configuration for a selected COM port, click on the "Apply" button and reboot your PC for settings to take place in your Windows registry.

Clear button – This button deletes the settings for a selected COM port.

Cancel button – This button closes the iPORT window without saving the settings.

In **Figure 4.30**, if a COM port number is dimmed and cannot be selected, it means that the COM port is already used by another application or it could be a physical serial COM port on that PC.

The serial communication settings (baud rate, data bit, stop bit and parity) of your application software must be identical to the serial communication settings of the iServer's serial port and your serial device's port connected to the iServer. You can use a Web browser to log into the iServer and configure its serial port's settings (see **Section 4.3.4.A**).

4.12 Mail Notifier Software

The Mail Notifier Software can only be used with our brand of instruments. For complete information of how to use the Mail Notifier software, click on the Help menu of the main window.

The Mail Notifier software generates email notifications for alarm conditions. Users can be notified automatically of alarm conditions monitored via internet connections throughout the world. By use of the email forwarding of alarm conditions, alarm conditions can be monitored on a network isolated from the internet and forwarded to connections on the Internet.

The Mail Notifier utility operates under Windows 98, NT 4.0, 2000, and XP in conjunction with existing email that supports the MAPI messaging interface. If MS Outlook has been loaded, the MAPI support should be available.

4.12.1 Installation

The Mail Notifier must be loaded on a computer running Microsoft Windows (versions specified earlier) using an email program that provides MAPI access. Network access must be available between this computer and the iServer. Network access must also be available from this computer to the appropriate email server and from the email server to the recipient's email server.

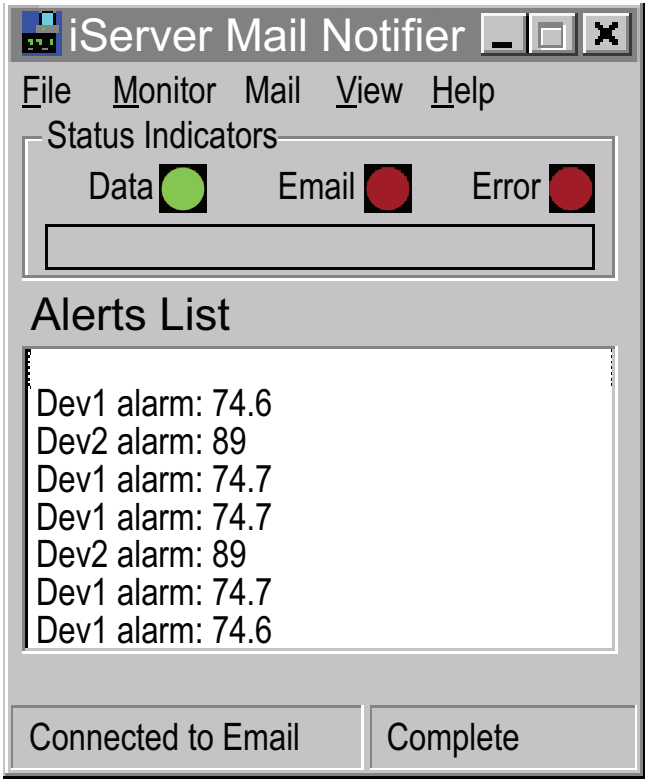


Figure 4.31 iServer Mail Notifier Main Window

4.12.2 Program Options Setup and Configuration

Complete program setup requires:

- Entering a recipient for the email
- Specifying connection details to MAPI services.
- Defining alarms for devices, and selecting how and when the email will be active.

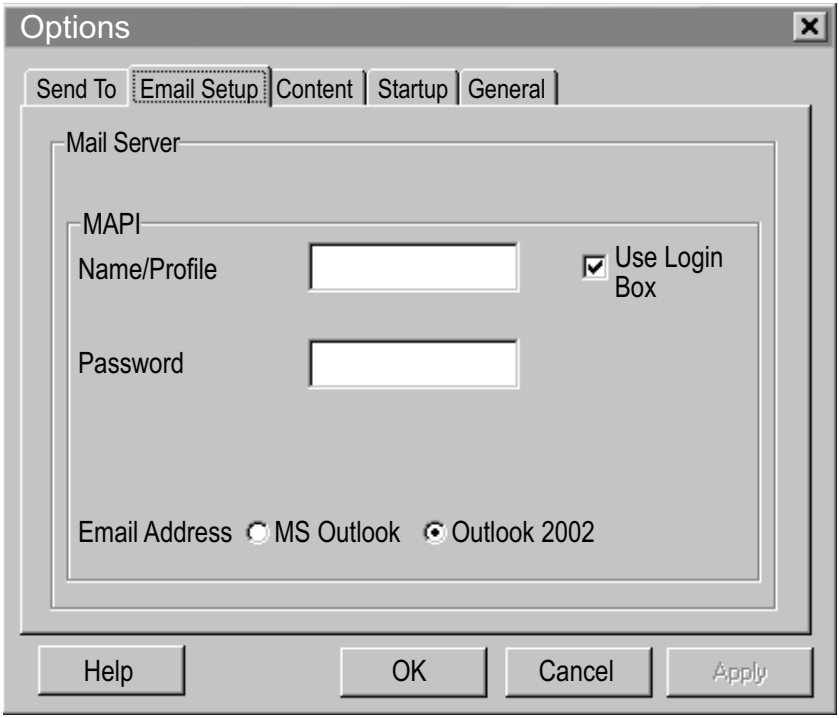


Figure 4.32 iServer Mail Notifier Profile Setup

Email Address Setup

The email addresses must be entered using individual addresses or alias. Select "Options" from the "View" menu and enter the email addresses on the "Send To" screen. This will be the list of email addresses to which alarm notifications will be sent.

Email Setup

The Mail Notifier is compatible with original MS Outlook™ and Outlook™ 2002 to 2005.

The Mail Notifier will attempt to automatically identify whether the Outlook is a newer version. A red bar appears under the Mail Notifier splash window to confirm that the detection of the 2002 or newer version is acceptable. With the newer versions, no additional steps should be taken to enable the connection between the Mail Notifier and the Email server.

Note MS Outlook tends to require that the users respond to a "login box" in order for email access to be activated for Mail Notifier. Some other email clients may allow for Mail Notifier to gain access without user login, as may be desired for a system recovering from a power outage. See the Help files for more information.

4.12.3 Device Setting and Configuration

Device setup requires:

- Entering the IP Address for iServer device (for example **192.168.1.200**).
- Specifying Socket (or Port) Number (1000 or 2000 depending on iServer settings).
- Defining RS485 Unit # interface address (1 to 199). Enter "0" for RS232 interface or for iServer.
- Entering Reading Command. Normally set to **X01** to obtain reading from the devices.If you want to change this setting, refer to HTTPget **Section 4.8**.
- Defining the Alarm Setup (High/Low, High value, or Low value).
- Specifying Pause Interval. It determines how many seconds each subsequential alarm notification will be sent.
- Determining Monitor Interval. It establishes the interval or time resolution in seconds for which readings will be obtained from the device.

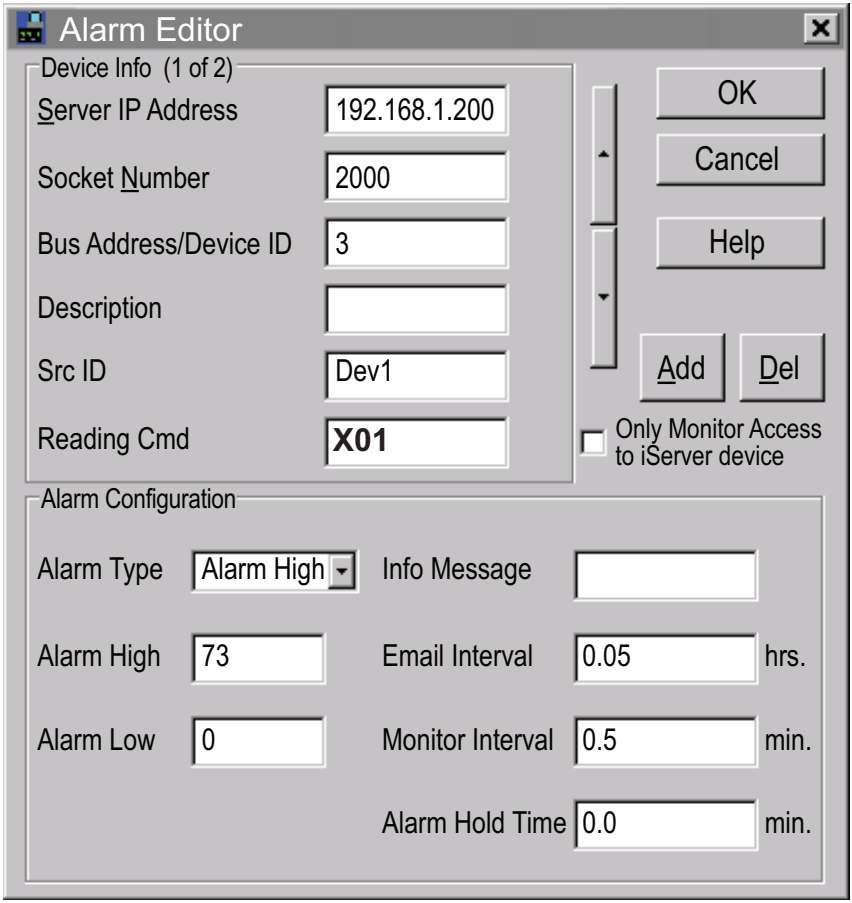


Figure 4.33 iServer Mail Notifier Device Setting

4.13 iLog Software

The iLog Software can only be used with our brand of instruments. For complete information of how to use the iLog software, click on the Help menu of the main window.

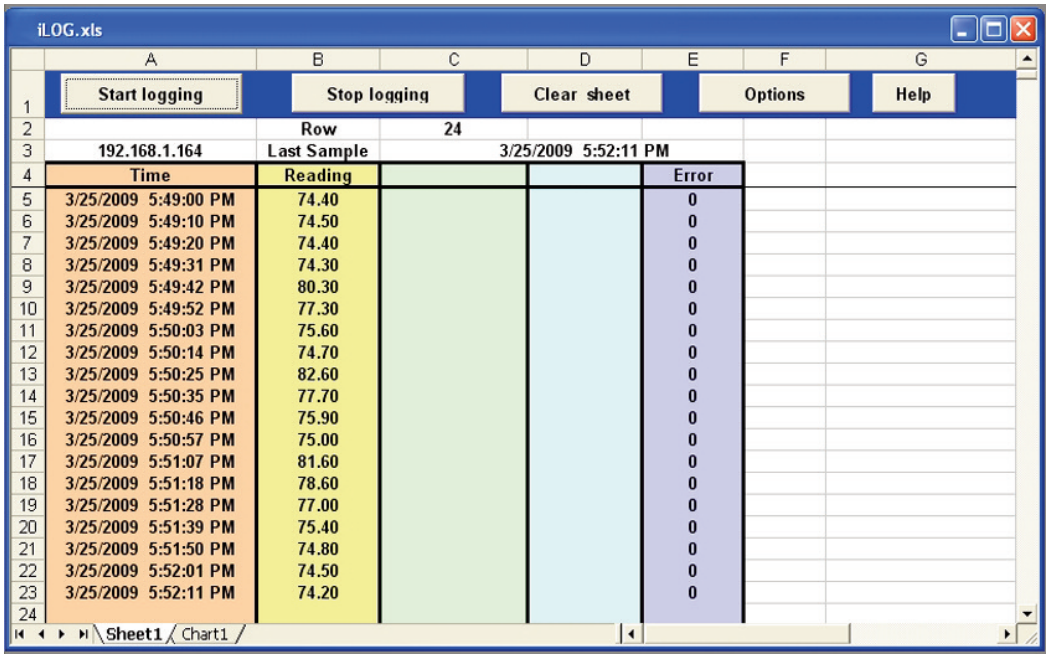
This is an Excel application software that can log data from our instruments over the local network (Ethernet) or the internet.

a) Download the iLog software from the website listed in this manual.

b) Install iLog software on a networked PC. This software is compatible with Windows 95, 98, NT, 2000, and XP.

c) For complete information of how to use the iLog software, click on the HELP button.

d) There is a list of Error Messages in **Appendix E**.



Time	Reading	Error
3/25/2009 5:49:00 PM	74.40	0
3/25/2009 5:49:10 PM	74.50	0
3/25/2009 5:49:20 PM	74.40	0
3/25/2009 5:49:31 PM	74.30	0
3/25/2009 5:49:42 PM	80.30	0
3/25/2009 5:49:52 PM	77.30	0
3/25/2009 5:50:03 PM	75.60	0
3/25/2009 5:50:14 PM	74.70	0
3/25/2009 5:50:25 PM	82.60	0
3/25/2009 5:50:35 PM	77.70	0
3/25/2009 5:50:46 PM	75.90	0
3/25/2009 5:50:57 PM	75.00	0
3/25/2009 5:51:07 PM	81.60	0
3/25/2009 5:51:18 PM	78.60	0
3/25/2009 5:51:28 PM	77.00	0
3/25/2009 5:51:39 PM	75.40	0
3/25/2009 5:51:50 PM	74.80	0
3/25/2009 5:52:01 PM	74.50	0
3/25/2009 5:52:11 PM	74.20	0

Figure 4.34 iLog Software Logging Data from an iSeries

PART 5 SPECIFICATIONS

Serial Interface

Interface:	RS232 or RS485 (2-wire)
Connector:	DB9 (male DTE) for Wall Mount; 8 position Terminal Block plugs for DIN Rail
Serial Data Rates:	300 to 115,200 bps
Characters:	7 or 8 data bits
Parity:	odd, even, or none
Stop Bits:	1 or 2
Flow Control:	Hardware (CTS/RTS) and Software (Xon/Xoff)
Digital I/O's	4 digital input/output lines

Network Interface

Interface:	Ethernet 10BASE-T
Connector:	RJ45
Protocols:	TCP/IP, UDP/IP, ARP, ICMP, DHCP, DNS, HTTP, Telnet simulation, and Modbus TCP/IP
Compliant to Standard:	IEEE 802.3
Indicators (LED's):	Network Activity (red), Network Link (green), TX-Transmit (yellow), RX-Receive (green); Power (green)
Processor CPU:	Enhanced 8051, 22 MHz
Processor Memory:	512 Kbyte Flash, 16 Kbyte SRAM
Embedded Web Server:	Serves dynamic Web pages and Java applets (256 Kbyte capacity)
Management:	Device configuration and monitoring through embedded Web server, Telnet login, Serial login, iConnect

General

Power Input (for EIS-W):	9 to 12 Vdc
Consumption:	2.5 W max.
Safety Qualified ac Power Adapter (included):	
Nominal Output:	9 Vdc @ 0.5 A
Input:	100 to 240 Vac, 50/60 Hz
Operating Temp:	0 to 40°C (32 to 104°F)
Power Input (for EIS-2B):	10 to 32 Vdc
Consumption:	2 W max (DC Power supply sold separately: **iDRN-PS-1000**)
Operating Temperature:	0 to 70°C (32 to 158°F)
Storage Temperature:	-40 to 125°C (-40 to 257°F)
UL Safety Tested:	0 to 50°C (32 to 122°F)
Agency Approvals	FCC-B, UL, C/UL, CE
Software:	Firmware upgradeable; COM Port Redirector (**iPort**); Configuration software (**iConnect**)

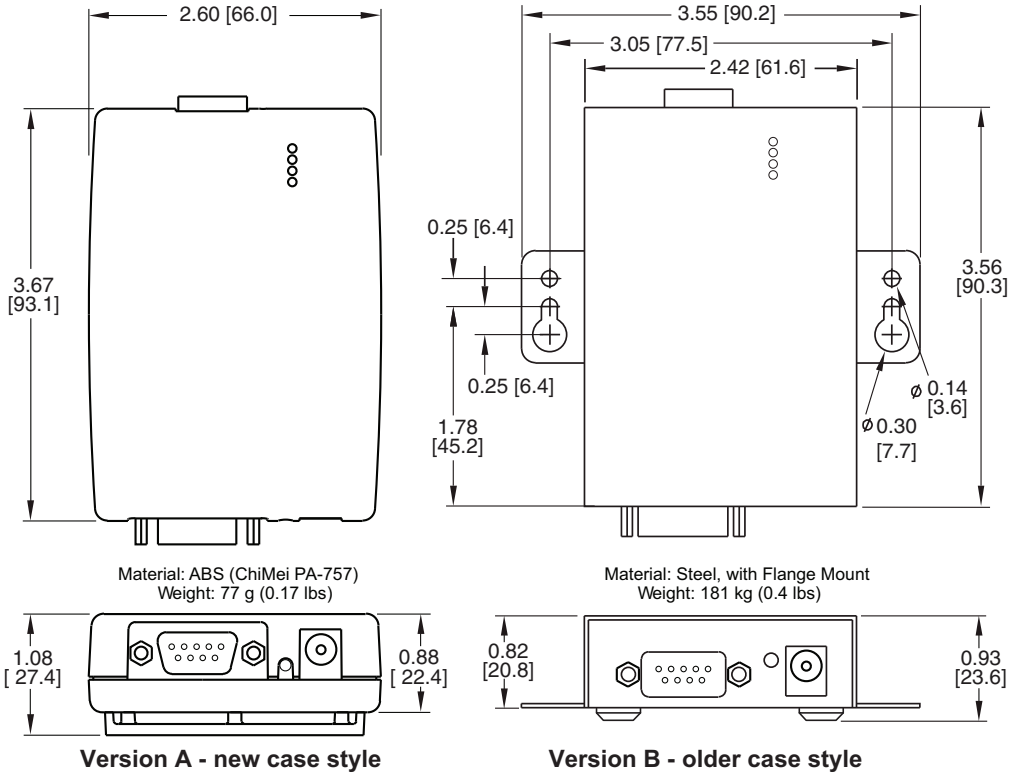
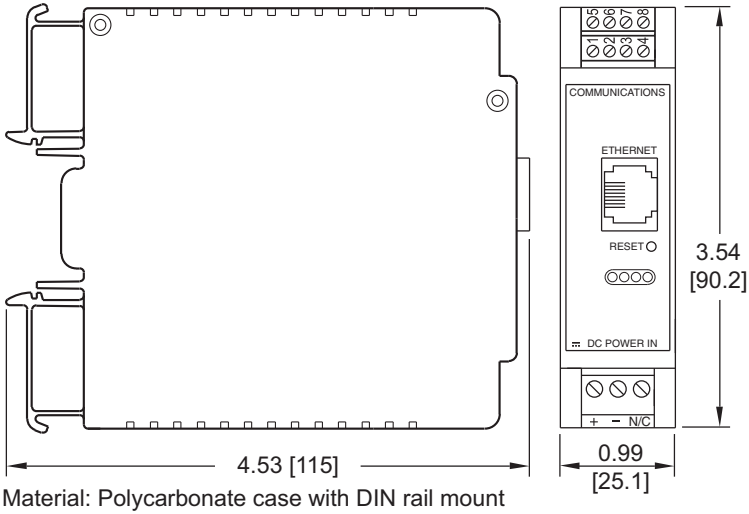


Figure 5.1 Wall Mount iServer Dimensions



Material: Polycarbonate case with DIN rail mount
Weight: 113 g (0.25 lbs)

Figure 5.2 DIN Rail iServer Dimensions

PART 6
FACTORY PRESET VALUES

PRESET PARAMETERS	FACTORY DEFAULTS
Network Interface:	
IP Address	192.168.1.200
Gateway Address	0.0.0.0
Subnet Mask	255.255.255.0
Device Host Name	eis and Last 4 digits from the MAC address
Login Password	12345678
Admin Password	00000000
DHCP	Disabled
Serial Interface:	
Communication Protocol	RS232
Flow Control	None
Baud Rate	9600
Parity	None
Stop Bit	1 bit
Data Bit	8 bits
Timeout	0 msec
End Character	00 (Hex) (Carridge Return)
Terminal Server:	
Server Type	Slave
Number of Connections	5
Port #	2000
Server Mode	Disable
Remote Access (Tunneling):	
Remote Access	Disable
Remote Port	2000
Remote IP Address	0.0.0.0

APPENDIX A GLOSSARY

User of this manual should be familiar with following definitions:

ARP (Address Resolution Protocol) is a protocol for mapping an Internet Protocol address (IP address) to a physical machine address that is recognized in the local network. For example, the IP address in use today is an address that is 32-bits long. In an Ethernet local area network, however, addresses for attached devices are 48-bits long. (The physical machine address is also known as a Media Access Control or MAC address.) A table, usually called the ARP cache, is used to maintain a correlation between each MAC address and its corresponding IP address. ARP provides the protocol rules for making this correlation and providing address conversion in both directions.

Ethernet is a network protocol defined by the IEEE 802.3 standard. Ethernet-based networks use MAC Address rather then IP Address to exchange data between computers. By using ARP and adding TCP/IP support, Ethernet devices may be connected as part of the Internet. An Ethernet LAN typically uses coaxial cable or special grades of twisted pair wires. The most commonly installed Ethernet systems are called 10BASE-T and provide transmission speeds up to 10 Mbps. Devices are connected to the cable and compete for access using a Carrier Sense Multiple Access with Collision Detection (CSMA/CD) protocol.

IP (Internet Protocol) is the method or protocol by which data is sent from one computer to another on the Internet.

IP address (Internet Protocol address) is a 32-bit number that identifies each sender or receiver of information that is sent in packets across the Internet.

IP Netmask is a 32-bit pattern of bits used to determine which part of the IP address is the network portion and which part is the host portion.

MAC (Media Access Control) Address is your computer's unique hardware number. When you're connected to the Internet from your computer, a correspondence table relates your IP address to your computer's physical (MAC) address on the LAN.

Ping is a utility that tests the network connectivity. It is used to determine if the host is capable of exchanging information with another host.

Port number/Socket number is a way to identify a specific process to which an Internet or other network message is to be forwarded when it arrives at a server. It is a predefined address that serves as a route from the application to the Transport layer or from the Transport layer to the application of the TCP/IP system.

Sockets are a method for communication between a client program and a server program in a network and defined as "the endpoint in a connection." Information transferred across the Internet primarily occurs between sockets.

TCP/IP (Transmission Control Protocol/Internet Protocol) is the basic communication language or protocol of the Internet. When you are set up with direct access to the Internet, your computer is provided with a copy of the TCP/IP program just as every other computer that you may send messages to or get information from also has a copy of TCP/IP. TCP/IP often is used as a general term to indicate generic access to the Internet.

Appendix B IP Address

An IP address is a unique 32-bit address assigned to a computer and includes:

- A network ID number identifying a network.
- A host ID number identifying a computer on the network.

All IP addresses have been divided into three smaller groups (classes) A, B and C

- **Class A** addresses have 8-bits of network ID and 24-bits of host ID. They can support a large number of hosts, approximately 2 = 16,777,216 computers per network.

  The IP addresses range in binary from 00000001.xxxxxxxx.xxxxxxxx.xxxxxxxx
  to 01111111.xxxxxxxx.xxxxxxxx.xxxxxxxx

  The IP addresses range in decimal from 1.x.x.x to 127.x.x.x

  Class A network ID's support a very large number of hosts.

- **Class B** addresses have 16-bits of network ID and 16-bits of host ID. They can support approximately 2^{16} = 65,536 computers per network.

The IP addresses range in binary from 10000000 00000000.xxxxxxxx.xxxxxxxx
to 10111111 11111111.xxxxxxxx.xxxxxxxx

  The IP addresses range in decimal from 128.0.x.x to 191.255.xxx.xxx

  Class B network ID's support a medium number of hosts.

- **Class C** addresses have 24-bits of network ID and 8-bits of host ID. They can support approximately 2^{8} = 256 computers per network.

  The IP addresses range in binary from 11000000.00000000.00000000.xxxxxxxx
  to 11011111.11111111.11111111.xxxxxxxx

  The IP addresses range in decimal from 192.0.0.xxx to 223.255.255.xxx

  Class C network ID's support a small number of hosts.

Note The rest of the addresses are divided into two classes, D and E.
Class D networks are not assigned to the host. They are used for multicasting.
The address range from 224.x.x.x to 239.x.x.x

Class E networks are experimental or reserved addresses.
The address range from 240.x.x.x to 247.x.x.x

Appendix C IP Netmask

IP Netmask or Subnet Mask is a 32-bit pattern of ones and zeros used to determine network portion of an IP address from the host portion of the IP address. Subnet mask is a network ID that is created by borrowing bits from host portion of IP address and using them as part of a network ID. The table below shows a default subnet mask for address Classes A, B, and C. Each bit that is set to "1" in the subnet mask corresponds to the bit in the IP address that is to be used as the network ID. Each bit that is set to "0" in the subnet mask corresponds to a bit in the IP address that is to be used as the host ID.

Address Class	Mask Binary Value	Mask Decimal Value or Dotted Notation
Class A	11111111 00000000 00000000 00000000	255.0.0.0
Class B	11111111 11111111 00000000 00000000	255.255.0.0
Class C	11111111 11111111 11111111 00000000	255.255.255.0

If your network requires more network ID's, you can extend the default subnet mask to include additional bits from the host ID. This allows for additional network ID's within the network. The table below shows some examples of subnet masks and bits moved from the hosts ID to create a new subnet.

Mask Dotted Notation	Mask Binary	Mask Bits
	Class A	
255.0.0.0 (Default)	11111111 00000000 00000000 00000000	0
255.192.0.0	11111111 11000000 00000000 00000000	2
255.224.0.0	11111111 11100000 00000000 00000000	3
255.240.0.0	11111111 11110000 00000000 00000000	4
255.248.0.0	11111111 11111000 00000000 00000000	5
255.252.0.0	11111111 11111100 00000000 00000000	6
255.254.0.0	11111111 11111110 00000000 00000000	7
255.255.0.0	11111111 11111111 00000000 00000000	8
255.255.128.0	11111111 11111111 10000000 00000000	9
255.255.192.0.0	11111111 11111111 11000000 00000000	10
.....	. . . . .	.
255.255.255.252	11111111 11111111 11111111 11111100	22
	Class B	
255.255.0.0 (Default)	11111111 11111111 00000000 00000000	0
255.255.192.0	11111111 11111111 11000000 00000000	2
.....	. . . . .	.
255.255.255.252	11111111 11111111 11111111 11111100	14
	Class C	
255.255.255.0 (Default)	11111111 11111111 11111111 00000000	0
255.255.255.192	11111111 11111111 11111111 11000000	2
.....	. . . . .	.
255.255.255.254	11111111 11111111 11111111 11111100	6

To determine the number of valid hosts ID's remaining after subnetting, use the following equation: $2^n - 2$, where n is the number of octet digits left after the subnet mask.

Appendix D ASCII Chart

ASCII Char	Dec	Hex	Binary No Parity	ASCII Char	Dec	Hex	Binary No parity
NUL	00	00	00000000	@	64	40	01000000
SOH	01	01	00000001	A	65	41	01000000
STX	02	02	00000010	B	66	42	01000010
ETX	03	03	00000011	C	67	43	01000011
EOT	04	04	00000100	D	68	44	01000100
ENQ	05	05	00000101	E	69	45	01000101
ACK	06	06	00000110	F	70	46	01000110
BEL	07	07	00000111	G	71	47	01000111
BS	08	08	00001000	H	72	48	01001000
HT	09	09	00001001	I	73	49	01001001
LF	10	0A	00001010	J	74	4A	01001010
VT	11	0B	00001011	K	75	4B	01001011
FF	12	0C	00001100	L	76	4C	01001100
CR	13	0D	00001101	M	77	4D	01001101
SO	14	0E	00001110	N	78	4E	01001110
SI	15	0F	00001111	O	79	4F	01001111
DLE	16	10	00010000	P	80	50	01010000
DC1	17	11	00010001	Q	81	51	01010001
DC2	18	12	00010010	R	82	52	01010010
DC3	19	13	00010011	S	83	53	01010011
DC4	20	14	00010100	T	84	54	01010100
NAK	21	15	00010101	U	85	55	01010101
SYN	22	16	00010110	V	86	56	01010110
ETB	23	17	00010111	W	87	57	01010111
CAN	24	18	00011000	X	88	58	01011000
EM	25	19	00011001	Y	89	59	01011001
SUB	26	1A	00011010	Z	90	5A	01011010
ESC	27	1B	00011011	[	91	5B	01011011
FS	28	1C	00011100	\	92	5C	01011100
GS	29	1D	00011101	]	93	5D	01011101
RS	30	1E	00011110	^	94	5E	01011110
US	31	1F	00011111	_	95	5F	01011111
SP	32	20	00100000	`	96	60	01100000
!	33	21	00100001	a	97	61	01100001
"	34	22	00100010	b	98	62	01100010
#	35	23	00100011	c	99	63	01100011
$	36	24	00100100	d	100	64	01100100
%	37	25	00100101	e	101	65	01100101
&	38	26	00100110	f	102	66	01100110
‘	39	27	00100111	g	103	67	01100111
(	40	28	00101000	h	104	68	01101000
)	41	29	00101001	I	105	69	01101001
*	42	2A	00101010	j	106	6A	01101010
+	43	2B	00101011	k	107	6B	01101011
,	44	2C	00101100	l	108	6C	01101100
-	45	2D	00101101	m	109	6D	01101101
.	46	2E	00101110	n	110	6E	01101110

Appendix D **ASCII Chart Continuation**

/	47	2F	00101111	o	111	6F	01101111
0	48	30	00110000	p	112	70	01110000
1	49	31	00110001	q	113	71	01110001
2	50	32	00110010	r	114	72	01110010
3	51	33	00110011	s	115	73	01110011
4	52	34	00110100	t	116	74	01110100
5	53	35	00110101	u	117	75	01110101
6	54	36	00110110	v	118	76	01110110
7	55	37	00110111	w	119	77	01110111
8	56	38	00111000	x	120	78	01111000
9	57	39	00111001	y	121	79	01111001
:	58	3A	00111010	z	122	7A	01111010
;	59	3B	00111011	{	123	7B	01111011
<	60	3C	00111100	|	124	7C	01111100
=	61	3D	00111101	}	125	7D	01111101
>	62	3E	00111110	~	126	7E	01111110
?	63	3F	00111111	DEL	127	7F	01111111

ASCII Control Codes

ASCII Char	Dec	Hex	Ctrl Key Equiv.	Definition	ASCII Char	Dec	Hex	Ctrl Key Equiv.	Definition
NUL	00	00	Crtl @	Null Character	DC1	17	11	Crtl Q	Data Control 1 - XON
SOH	01	01	Crtl A	Start of Header	DC2	18	12	Crtl R	Data Control 2
STX	02	02	Crtl B	Start of Text	DC3	19	13	Crtl S	Data Control 3 - XOFF
ETX	03	03	Crtl C	End of Text	DC4	20	14	Crtl T	Data Control 4
EOT	04	04	Crtl D	End of Transmission	NAK	21	15	Crtl U	Negative Acknowledge
ENQ	05	05	Crtl E	Inquiry	SYN	22	16	Crtl V	Synchronous Idle
ACK	06	06	Crtl F	Acknowledge	ETB	23	17	Crtl W	End of Trans Block
BEL	07	07	Crtl G	Bell	CAN	24	18	Crtl X	Cancel
BS	08	08	Crtl H	Back Space	EM	25	19	Crtl Y	End of Medium
HT	09	09	Crtl I	Horizontal Tabulation	SUB	26	1A	Crtl Z	Substitute
LF	10	0A	Crtl J	Line Feed	ESC	27	1B	Crtl [	Escape
VT	11	0B	Crtl K	Vertical Tabulation	FS	28	1C	Crtl \	File Separator
FF	12	0C	Crtl L	Form Feed	GS	29	1D	Crtl]	Group Separator
CR	13	0D	Crtl M	Carriage Return	RS	30	1E	Crtl |	Record Separator
SO	14	0E	Crtl N	Shift Out	US	31	1F	Crtl _	Unit Separator
SI	15	0F	Crtl O	Shift In	SP	32	20		Space
DLE	16	10	Crtl P	Data Link Escape					

Appendix E iLog Error Messages

Error #	Description	Note
-8003	User stopped logging readings.	
-10005	Failed to find the iSeries.	Ethernet cable is disconnected, iSeries is powered off, connections across the firewall require longer “connection to socket time out” setting.
-10006	Windows socket was closed.	
-10007	Windows socket error.	Wrong IP or wrong Port number was used.
-10008	The iSeries failed to respond to a request.	Wrong IP or wrong Port number was used.
-10011	Response came empty.	No data was sent.
-10012	Device responded with "Serial Time Out" string.	Possibly the iLog is configured for wrong product model.
-10014	Terminal Server Mode when the Port is 1000.	Try Port 2000 in iLog configuration.
-15100	Error on obtaining the temperature reading.	Possibly the iLog is configured for wrong product model.

PART 7
APPROVALS INFORMATION

7.1 CE APPROVAL

CE This product conforms to the EMC directive 89/336/EEC amended by 93/68/EEC, and with the European Low Voltage Directive 72/23/EEC.

Electrical Safety EN61010-1:2001

Safety requirements for electrical equipment for measurement, control and laboratory.

Basic Insulation

Pollution Degree 2

Dielectric withstand Test per 1 min

- Input Power to Ethernet Output: 1500Vac
- Input Power to I/O lines (DB9): none

Measurement Category I

Category I are measurements performed on circuits not directly connected to the Mains Supply (power).

Transients Overvoltage Surge (1.2/50uS Pulse)

- Input Power: 500V Transients Overvoltage
- Ethernet: 1500V Transients Overvoltage

Note: *The ac/dc power adapter must have Safety Qualified Agency Approvals for CE with Double Insulation rating.*

The ac/dc power adapter is 9Vdc.

The minimum output current rating is 500mA.

EMC EN61000-6-1:2001 (Immunity) and EN61000-6-3:2001 (Emissions)

Immunity requirements for residential, commercial and light-industrial environments

- EMC Emissions Table 1, Class B
- EMC Immunity Table 1: Enclosure
  Table 2: Signal Lines Ports
  Table 3: Dc input/Dc output Ports

EMC EN61326:1997 + and A1:1998 + A2:2001

Immunity and Emissions requirements for electrical equipment for measurement, control and laboratory.

- EMC Emissions Table 4, Class B of EN61326
- EMC Immunity Table 1 of EN61326

Note: *I/O lines (DB9) require shielded cables and these cables must be located on conductive cable trays or in conduits. Furthermore, the length of these cables should not exceed 30 meters*

Refer to the EMC and Safety installation considerations (Guidelines) of this manual for additional information.

7.2 FCC

This device complies with Part 15, Subpart B, Class B of the FCC rules.

NOTES

NOTES

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **one (1) year** from the date of purchase. In addition to OMEGA's standard warranty period, OMEGA Engineering will extend the warranty period for **one (1) additional year** if the warranty card enclosed with each instrument is returned to OMEGA.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by it will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESS OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

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Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR WARRANTY RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR NON-WARRANTY REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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